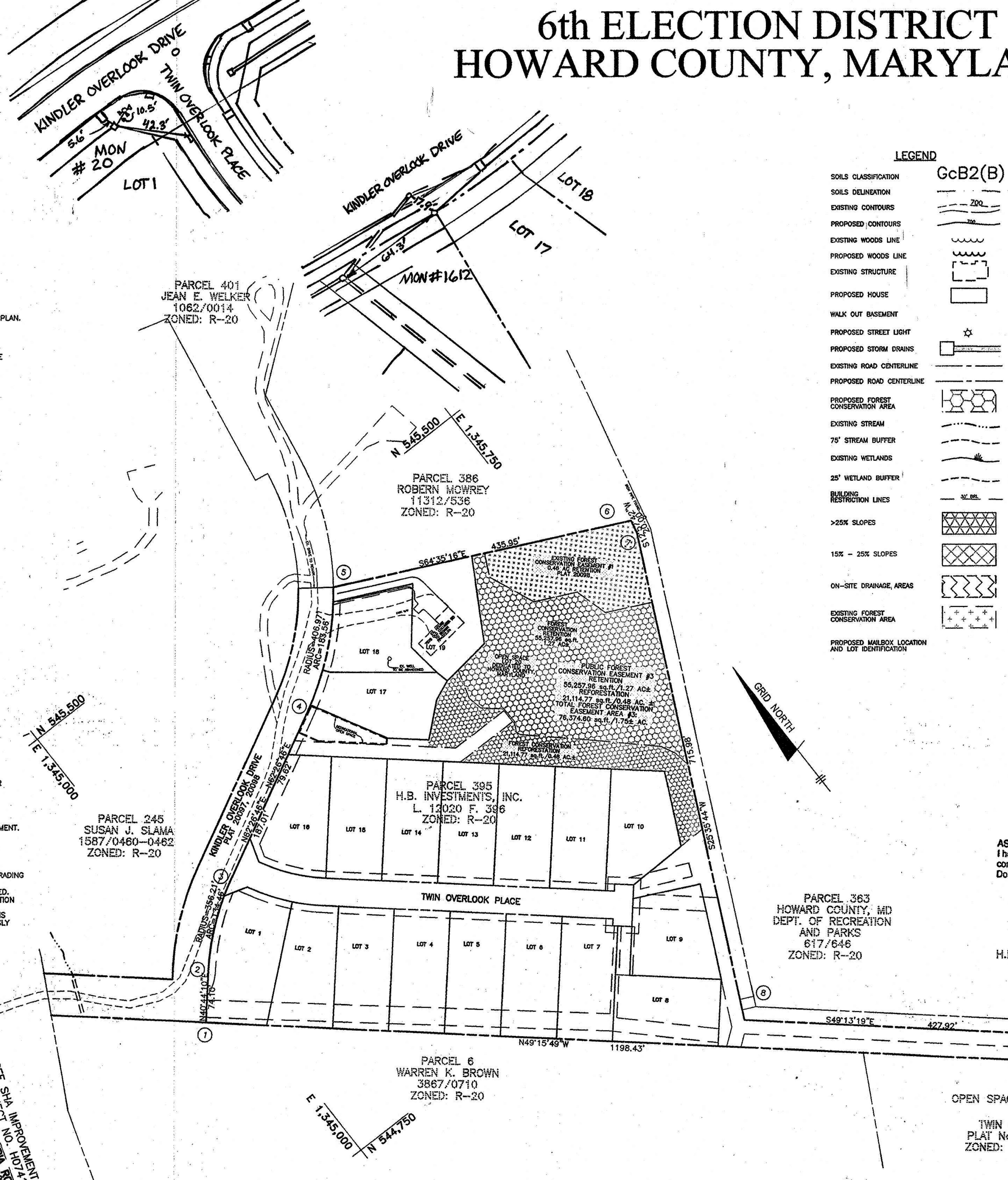
REVISED FINAL ROAD CONSTRUCTION PLANS
KINDLER OVERLOOK
LOTS 1-19 AND OPEN SPACE LOT 20
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

GENERAL NOTES

1. THE SUBJECT PROPERTY IS ZONED R-20 PER THE 2/2/04 COMPREHENSIVE ZONING PLAN AND THE "COMP LITE" ZONING AMENDMENTS EFFECTIVE JULY 28, 2006.
2. THIS PLAN IS SUBJECT TO THE FIFTH EDITION OF THE SUBDIVISION REGULATIONS AND ZONING REGULATIONS, AS AMENDED BY COUNCIL BILL 50-2001.
3. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY, PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.
4. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST 5 (FIVE) WORKING DAYS PRIOR TO THE START OF WORK.
5. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK.
6. PROJECT BACKGROUND:
   LOCATION: TAX MAP 41 – BLOCK 18 – PARCEL 385, 395, P/O PARCEL 401
   ZONING: R-20
   TOTAL TRACT AREA: 11.54 AC.±
   NUMBER OF EXISTING STRUCTURES: 1
7. TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE MOST CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
8. THE EXISTING TOPOGRAPHY IS TAKEN FROM FIELD RUN SURVEY WITH 2 FOOT CONTOUR INTERVALS PREPARED BY BENCHMARK ENGINEERING INC DATED DECEMBER 2000.
9. HORIZONTAL DATUMS FOR THIS PLAN ARE BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM NAD-83 AS PROJECTED FROM SHA TRAVERSE NOS. SHA CADD-175 AND SHA CADD-176.
10. WETLAND DELINEATION PROVIDED BY ECO-SCIENCE PROFESSIONALS, INC., DATED JULY 11, 2000 AND APPROVED AS PART OF SP-03-01
11. AN APFO TRAFFIC STUDY HAS BEEN PERFORMED BY THE TRAFFIC GROUP DATED JULY 12, 2000 AND REVISED NOVEMBER, 2000. NEW TRAFFIC COUNTS WERE TAKEN IN JUNE, 2002. THE APFO STUDY WAS APPROVED AS PART OF SP-03-01
12. FOREST STAND DELINEATION PROVIDED BY ECO-SCIENCES, INC., DATED JULY, 2000.
13. ALL LANDSCAPING REQUIREMENTS AS SET FORTH IN THE LANDSCAPE MANUAL SHALL BE COMPLIED WITH. PRESERVATION OF THE SPECIMEN TREES AND FOREST LAND SHALL BE AS SHOWN ON THE ESC FINAL PLANS.
14. NO DISTURBANCE SHALL OCCUR IN THE WETLANDS, 25' WETLAND BUFFER, 75' STREAM BUFFER, FLOODPLAIN, OR FOREST CONSERVATION AREAS EXCEPT AS PERMITTED BY THE DEPARTMENT OF PLANNING AND ZONING AND/OR THE MDE PERMIT AND AS SHOWN ON THESE PLANS. THE DPZ HAS DETERMINED THE STREAM CROSSING ON PARCEL 401 TO BE ESSENTIAL FOR THE PURPOSE OF ACCESS INTO THE SITE.
15. MINIMUM BUILDABLE LOT SIZE SHALL BE 14,000 SQUARE FEET.
16. THIS PROPERTY IS WITHIN THE METROPOLITAN DISTRICT.
17. STORMWATER MANAGEMENT SHALL BE PROVIDED USING ENVIRONMENTAL SITE DESIGN METHODS. ON-LOT INFILTRATION BERMS SHALL BE OWNED AND MAINTAINED BY INDIVIDUAL PROPERTY OWNERS. ROADSIDE SWALES SHALL BE JOINTLY MAINTAINED BY THE HOA AND HOWARD COUNTY. ON-LOT BIO-SWALES (LOTS 1-7) SHALL BE JOINTLY MAINTAINED BY THE HOA AND INDIVIDUAL HOMEOWNER. INFILTRATION BERMS (LOTS 8-18) SHALL BE INSTALLED UNDER THE RESIDENTIAL SITE DEVELOPMENT PLAN. MORE DETAILED DESCRIPTIONS OF MAINTENANCE RESPONSIBILITY IS INCLUDED ON SHEET 8.
18. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO CEMETERY LOCATIONS ON-SITE.
19. STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (1993) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL DEVELOPMENTS (JUNE 1993)."
20. PREVIOUS DEPARTMENT OF PLANNING AND ZONING REFERENCE NUMBERS: SP-03-01, WP-02-112
21. FOR FLAG OR PIPESTEM LOTS, REFUSE COLLECTION, SNOW REMOVAL AND ROAD MAINTENANCE ARE PROVIDED TO THE JUNCTION OF THE FLAG OR PIPESTEM AND ROAD RIGHT OF WAY LINE AND NOT THE FLAG OR PIPESTEM LOT DRIVEWAY.
22. DRIVEWAYS SHALL BE PROVIDED PRIOR TO RESIDENTIAL OCCUPANCY TO INSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING MINIMUM REQUIREMENTS:
    a) WIDTH – 12' (16' SERVING MORE THAN ONE RESIDENCE).
    b) SURFACE – 6" OF COMPACT CRUSHER RUN BASE WITH TAR AND CHIP COATING (1-1/2" MIN.)
    c) GEOMETRY – MAXIMUM 15% GRADE, MAXIMUM 10% GRADE CHANGE AND MINIMUM 45' TURNING RADIUS.
    d) STRUCTURES (CULVERTS/BRIDGES) – CAPABLE OF SUPPORTING 25 GROSS TONS (H25 LOADING).
    e) DRAINAGE ELEMENTS – CAPABLE OF SAFELY PASSING 100 YEAR FLOODPLAIN WITH NO MORE THAN 1 FOOT DEPTH OVER DRIVEWAY.
    f) STRUCTURE CLEARANCES – MINIMUM 12 FEET.
    g) MAINTENANCE – SUFFICIENT TO INSURE ALL WEATHER USE.
23. PROPOSED KINDLER OVERLOOK DRIVE IS BEING PLACED WITHIN AN AREA RESERVED FOR ROADWAY CONSTRUCTION PER LIBER 647, FOLIO 551 AND DEDICATED IN PLATS 20097 AND 20098.
24. THERE IS AN EXISTING DWELLING TO REMAIN ON LOT 19. THE EXISTING DRIVEWAY TO THIS DWELLING SHALL BE RELOCATED AS SHOWN ON THESE PLANS. NO ADDITIONS OR EXTENSIONS MAY BE DONE EXCEPT THOSE IN ACCORDANCE WITH THE APPLICABLE ZONING REQUIREMENTS.
25. EXISTING UTILITIES WERE LOCATED BY RECORD DRAWINGS AND FIELD LOCATIONS. CONTRACTOR SHALL VERIFY LOCATION OF UTILITIES PRIOR TO CONSTRUCTION.
26. UNLESS NOTED AS "PRIVATE" ALL EASEMENTS ARE PUBLIC.
27. ALL ROAD FILLS SHALL BE COMPACTED TO 95% AS DETERMINED BY AASHTO T-180.
28. THE FLOODPLAIN STUDY FOR THIS PROJECT WAS PREPARED BY BENCHMARK ENGINEERING INC, DATED DECEMBER 18, 2002, AND WAS APPROVED AS PART OF THE PRELIMINARY PLAN, SP-03-01
29. WATER IS PUBLIC
30. SEWER IS PUBLIC
31. A WAIVER PETITION (WP-02-112) TO SECTION 16.147, REQUIRING A SUBDIVISION PLAT AND CONSTRUCTION PLANS FOR THE PURPOSE OF COMBINING TWO SEPARATE PARCELS INTO ONE PARCEL (i.e. PARCEL 385 AND P/O PARCEL 401) WAS SUBMITTED ON 5-8-02 AND WAS APPROVED BY THE PLANNING DIRECTOR ON 6-13-02. CONDITIONS OF THE APPROVAL ARE AS FOLLOWS:
    A. THE PETITIONER MUST MEET ALL DEADLINES AND MILESTONES AND RECORD A FINAL PLAT OR THE SAID PORTION OF PARCEL 401 MAY BE DEEDED BACK TO THE OWNER OF PARCEL 401 BY ANOTHER DEED ADJOINER.
    B. THE OWNER OF PARCEL 401 WILL NOT BE REQUIRED TO SIGN ANY APPLICATIONS OR PLANS BASED ON THE COURT ORDER.
    C. ACCESS THROUGH THE EXISTING RIGHT-OF-WAY RESERVATION SHALL BE MAINTAINED FOR ALL RELEVANT PARCELS (425, 313, 401, AND 386) AT ALL TIMES AND MAY NOT BE ABSTRACTED DURING THE SUBDIVISION PROCESS OR CONSTRUCTION PERIOD.
    D. THE OWNER OF PARCEL 401, OR A COURT APPOINTED PERSON AS SPECIFIED IN THE COURT ORDER SHALL SIGN THE DEED ADJOINER AND ANY OTHER DOCUMENTATION RELATED TO COMPLETION
32. LANDSCAPING FOR THIS SUBDIVISION IS PROVIDED IN ACCORDANCE WITH A CERTIFIED LANDSCAPE PLAN INCLUDED WITH THE ROAD CONSTRUCTION PLAN SET, AND IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. SURETY IN THE AMOUNT OF $10,650 FOR 30 SHADE TREES AND 11 PINE TREES WILL BE POSTED WITH THE DEVELOPER'S AGREEMENT.
33. DEVELOPER SHALL PROPERLY ABANDON EXISTING WELL AND SEPTIC ON LOT 19 PER THE HEALTH DEPARTMENT REQUIREMENT AFTER INSTALLATION AND CONNECTION OF THE PUBLIC WATER AND SEWER TO THE EXISTING STRUCTURE. WELL ABANDONMENT MUST BE DONE BY A LICENSED WELL DRILLER.
34. THE FOREST CONSERVATION EASEMENTS HAVE BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE AND FOREST CONSERVATION ACT. NO CLEARING, GRADING OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENT; HOWEVER FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED. ONSITE RETENTION OF 1.97 ACRE WILL REQUIRE $17,163 SURETY. ON-SITE AND OFFSITE REFORESTATION OF 2.60 ACRES WILL REQUIRE A SURETY OF $56,628. 0.48 ACRES OF REFORESTATION WILL BE PROVIDED ON-SITE AND 2.12 ACRES WILL BE RETAINED AT THE HARLESS PROPERTY. THIS PROJECT IS INCREASING THE ON-SITE RETENTION AND PROVIDING SOME ON-SITE REFORESTATION. THE PREVIOUSLY PLATTED OFF-SITE FOREST CONSERVATION HAS AN EXCESS AREA OF 2.95 ACRES, WHICH WILL BE DESIGNATED TO PROVIDE FOR THE FOREST OBLIGATIONS OF OTHER PROJECTS IN THE FUTURE.
35. WORK WITHIN THE STREAMS IS COVERED UNDER MDE PERMIT TRACKING NO. 200667614. NO INSTREAM CONSTRUCTION SHALL BE PERFORMED BETWEEN MARCH 1 AND JUNE 15.
36. STREET TREES WILL BE BONDED WITH ROADWAY CONSTRUCTION SURETY.
37. LANDSCAPE SURETY POSTED WITH THE DEVELOPER'S AGREEMENT FOR THE ORIGINAL F-07-003 IS SUFFICIENT TO COVER THE NEWLY PROPOSED LANDSCAPING CHANGES ASSOCIATED WITH THE REDLINE REVISIONS.
38. DRIVEWAY CULVERTS SHALL BE 12" HDPE.



PARCEL 363
HOWARD COUNTY, MD
DEPT. OF RECREATION AND PARKS
617/646
ZONED: R-20

PARCEL 395
H.B. INVESTMENTS, INC.
L. 12020 F. 396
ZONED: R-20

OPEN SPACE LOT 20 TO BE DEDICATED TO HOWARD COUNTY, MARYLAND

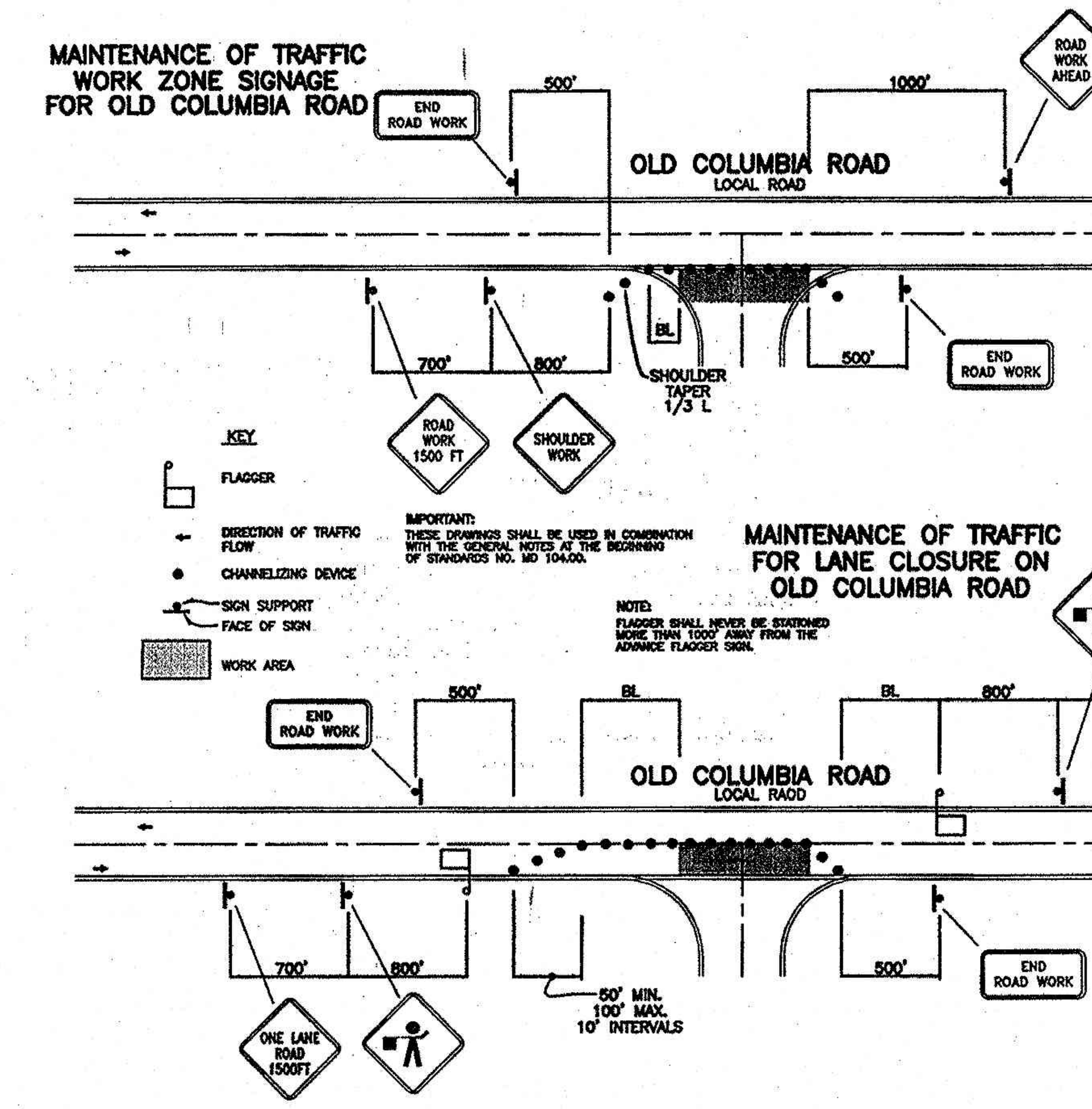
OPEN SPACE LOT 34

TWIN OAKS
PLAT No.6460
ZONED: R-20

PLAN VIEW
SCALE: 1" = 100'

LEGEND

- SOILS CLASSIFICATION — GcB2(B)
- SOILS DELINEATION
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WOODS LINE
- PROPOSED WOODS LINE
- EXISTING STRUCTURE
- PROPOSED HOUSE
- WALK OUT BASEMENT
- PROPOSED STREET LIGHT
- PROPOSED STORM DRAINS
- EXISTING ROAD CENTERLINE
- PROPOSED ROAD CENTERLINE
- PROPOSED FOREST CONSERVATION AREA
- EXISTING STREAM
- 75' STREAM BUFFER
- EXISTING WETLANDS
- 25' WETLAND BUFFER
- BUILDING RESTRICTION LINES
- >25% SLOPES
- 15% – 25% SLOPES
- ON-SITE DRAINAGE AREAS
- EXISTING FOREST CONSERVATION AREA
- PROPOSED MAILBOX LOCATION AND LOT IDENTIFICATION



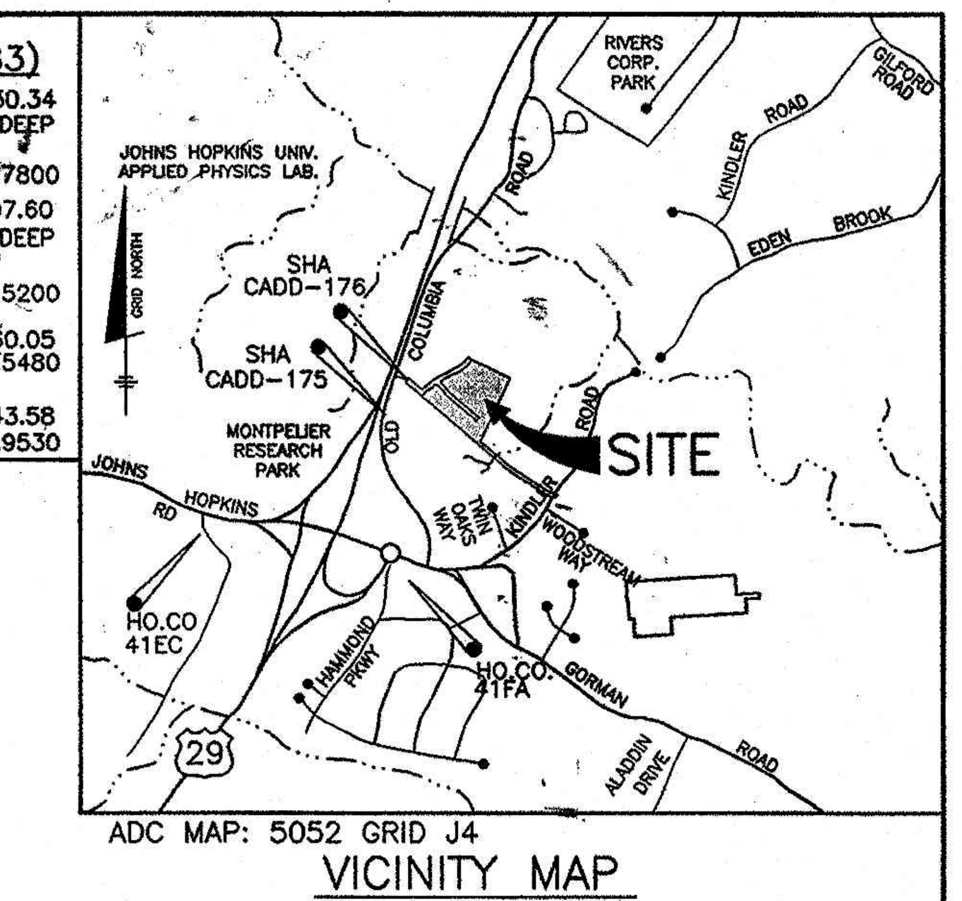
BENCH MARKS–(NAD'83)

HO.CO. 41EC ELEV. 430.34
STAMPED DISC SET ON TOP OF 3' DEEP COLUMN OF CONCRETE
N 543,588.8040 E 1,342,628.7800

HO.CO. 41FA ELEV. 407.60
STAMPED DISC SET ON TOP OF 3' DEEP COLUMN OF CONCRETE
N 543,109.9350 E 1,344,797.5200

SHA CADD-175 ELEV. 360.05
N 544,840.9060 E 1,344,552.5480

SHA CADD-176 ELEV. 343.58
N 545,210.7590 E 1,344,786.9530



ADC MAP: 5052 GRID J4

VICINITY MAP
SCALE: 1" = 2000'

AS-BUILT NOTES:

1.) HORIZONTAL DATUM FOR THIS AS-BUILT IS BASED ON THE MARYLAND STATE REFERENCE SYSTEM NAD 83/ADJ 91 AS PROJECTED FROM HO.CO. GEODETIC CONTROL STATIONS 41EC AND 41FA VERTICAL DATUM FOR THIS AS-BUILT IS NORTH AMERICAN VERTICAL DATUM NAVD 88 AS PROJECTED FROM THE ABOVE MENTIONED HOWARD COUNTY GEODETIC CONTROL STATIONS.
2.) THE INSTRUMENTS USED IN PERFORMING THE AS-BUILT WERE A 5" TOTAL STATION AND PRISM AND RTK GPS.
3.) THIS AS-BUILT WAS PERFORMED BY BENCHMARK ENGINEERING, INC.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-14

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 9-18-14

SITE DATA TABULATION

1) GENERAL SITE DATA
   a. PRESENT ZONING: R-20
   b. APPLICABLE DPZ FILE REFERENCES: SP-01-03 WP-02-112
   c. DEED REFERENCES: 5977/0251 6116/0479 1062/0014
   d. PROPOSED USE OF SITE: 19 SFD HOMES
   e. PROPOSED WATER AND SEWER SYSTEMS: PUBLIC

2) AREA TABULATION
   a. TOTAL AREA OF SITE.......... 11.54± AC.
   b. AREA OF 100 YEAR FLOODPLAIN.......... 0.06± AC.
   c. AREA OF STEEP SLOPES ON SITE (25% OR GREATER).......... 0.34± AC.
   d. NET AREA OF SITE.......... 11.14± AC
   e. AREA OF THIS PLAN SUBMISSION.......... 11.54± AC
   f. AREA OF PROPOSED BUILDABLE LOTS.......... 6.35± AC.
   g. AREA OF PROPOSED OPEN SPACE LOTS.......... 3.60± AC.
   h. AREA OF PROPOSED PUBLIC ROAD R/W.......... 1.59± AC

3) LOT TABULATION
   a. TOTAL NUMBER OF RESIDENTIAL LOTS PROPOSED ON THIS SUBMISSION.......... 19
   b. TOTAL NUMBER OF OPEN SPACE LOTS PROPOSED.......... 1

4) OPEN SPACE DATA
   a. MINIMUM RESIDENTIAL LOT SIZE SELECTED.......... 14,000 S.F.
   b. OPEN SPACE REQUIRED (30% OF 11.54 AC.).......... 3.46± AC
   c. OPEN SPACE PROVIDED.......... 3.60± AC
      NON-CREDITED (LESS THAN 35' IN WIDTH).......... 0.12± AC
      CREDITED.......... 3.48± AC
   d. AREA OF RECREATION OPEN SPACE REQUIRED.......... 3,800 S.F. (0.08±AC)
      (19 LOTS x 200s.f. PER LOT = 3,800 s.f.)
   e. AREA OF RECREATION OPEN SPACE PROVIDED.......... 3,829 S.F. (0.09±AC)

STATE OF MARYLAND — CHRISTOPHER A. MALAGARI — 22390 — PROFESSIONAL ENGINEER
DS CE
7/31/2024

NO.	DATE	REVISION
7	7.26.2024	IDENTIFY 0.2 ACRES OF FCON ESMT#8 TO BE UTILIZED FOR F-24-048
1	AUG 2010	REDESIGN TO INCORPORATE SWM ESD METHODS, REVISED BY SHEET SUBSTITUTION.

RIGHT OF WAY ELEVATION CHART NAD.83

R/W PT.NO.	DESCRIPTION	ELEVATION	R/W PT. NO.	DESCRIPTION	ELEVATION
1	REBAR & CAP	357.92'	24	REBAR & CAP	377.40'
2	REBAR & CAP	342.84'	25	REBAR & CAP	377.82'
3	REBAR & CAP	336.99'	26	REBAR & CAP	377.82'
4	REBAR & CAP	350.13'	27	REBAR & CAP	377.35'
5	REBAR & CAP	359.38'	28	REBAR & CAP	377.09'
6	REBAR & CAP	368.52'	30	REBAR & CAP	370.02'
7	REBAR & CAP	362.55'	31	REBAR & CAP	363.02'
8	REBAR & CAP	361.31'	32	REBAR & CAP	363.08'
19	REBAR & CAP	352.23'	33	REBAR & CAP	363.18'
20	CONC. MONUMENT	359.51'	35	REBAR & CAP	352.83'
21	REBAR & CAP	363.40'	38	REBAR & CAP	369.99'
22	REBAR & CAP	363.55'	1612	CONC. MONUMENT	366.66'

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 12-1-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 12/06/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 12/3/10

SHEET INDEX

NO.	DESCRIPTION
1	TITLE SHEET
2	ROAD AND LANDSCAPE PLAN
3	ROAD PROFILES
4	STORM DRAIN DRAINAGE AREA MAP
5	STORM DRAIN PROFILES
6	MASS GRADING, SEDIMENT AND EROSION CONTROL PLAN
7	SEDIMENT AND EROSION CONTROL NOTES AND DETAILS
8	STORM WATER MANAGEMENT DETAILS
9	FOREST CONSERVATION PLAN

PURPOSE STATEMENT:

THIS REVISED FINAL ROAD CONSTRUCTION PLAN HAS BEEN SUBMITTED FOR APPROVAL OF REVISIONS TO THE ON-LOT AND ROADSIDE STORMWATER TREATMENT METHODS, TO BRING THIS DEVELOPMENT INTO COMPLIANCE WITH ENVIRONMENTAL SITE DEVELOPMENT METHODS.

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
60 THOMAS JOHNSON DRIVE ▲ FREDERICK, MARYLAND 21702
(P) 301-371-3505 (F) 301-371-3506
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — CHRISTOPHER ALAN MALAGARI — No. 22390 — REGISTERED PROFESSIONAL ENGINEER

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 22390 Expiration Date: 6/30/11

OWNER/DEVELOPER:
HB DEVELOPMENT, INC.
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20723
410-792-2565

PROJECT:
KINDLER OVERLOOK
LOTS 1-19 AND OPEN SPACE 20
REVISED FINAL ROAD CONSTRUCTION PLAN

LOCATION: TAX MAP: 41 GRID: 18 PARCEL: 385, 395, P/O PARCEL 401 ZONED: R-20
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: TITLE SHEET

DATE:	JULY 2006 / AUGUST 2010	PROJECT NO.	1328
SCALE:	AS SHOWN	SHEET	1 OF 13

DESIGN: AAM DRAFT: MAN CHECK: CAM

AS-BUILT F-07-003

LANDSCAPE PLANTING LIST			
SYMBOL	QUANTITY	NAME	REMARKS
(+)	20	PLANTANUS ACERFOLIA 'BLOODGOOD' (Bloodgood London Plane)	2 1/2" MIN. CAL. B&B FULL HEAD
(⊕)	10	QUERCUS COCCINEA SCARLET OAK	2 1/2" MIN. CAL. B&B FULL HEAD
(evergreen)	11	PINUS STROBUS (Eastern White Pine)	5'–6' ht. UNSHEARED

STREET TREE PLANTING LIST			
SYMBOL	QUANTITY	NAME	REMARKS
(◎)	40	ACER RUBRA (Red Maple)	2 1/2" MIN. CAL. B&B FULL HEAD
(·)	26	ACER SACCHARUM (Sugar Maple)	2 1/2" MIN. CAL. B&B FULL HEAD

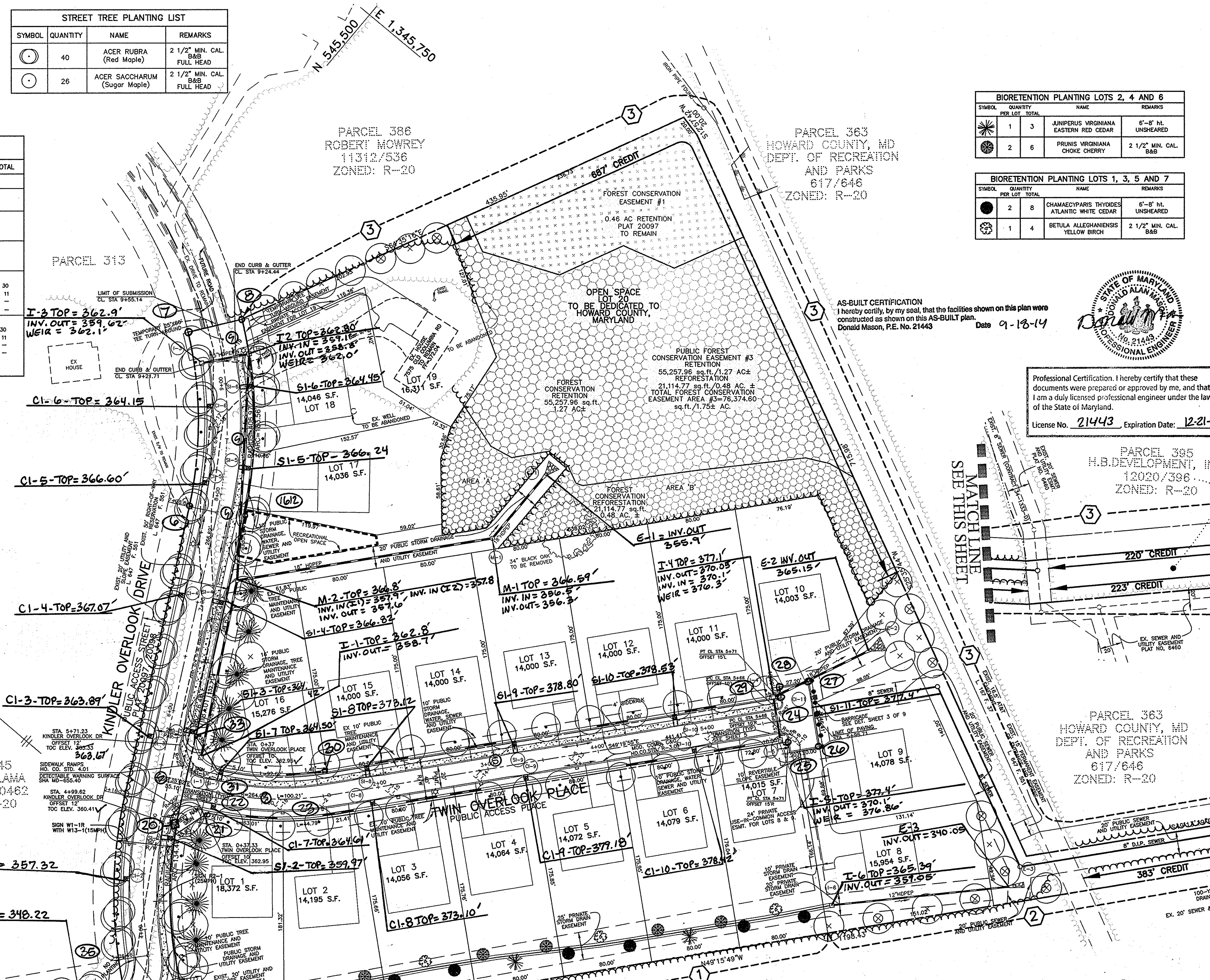
SCHEDULE A PERIMETER LANDSCAPE EDGE

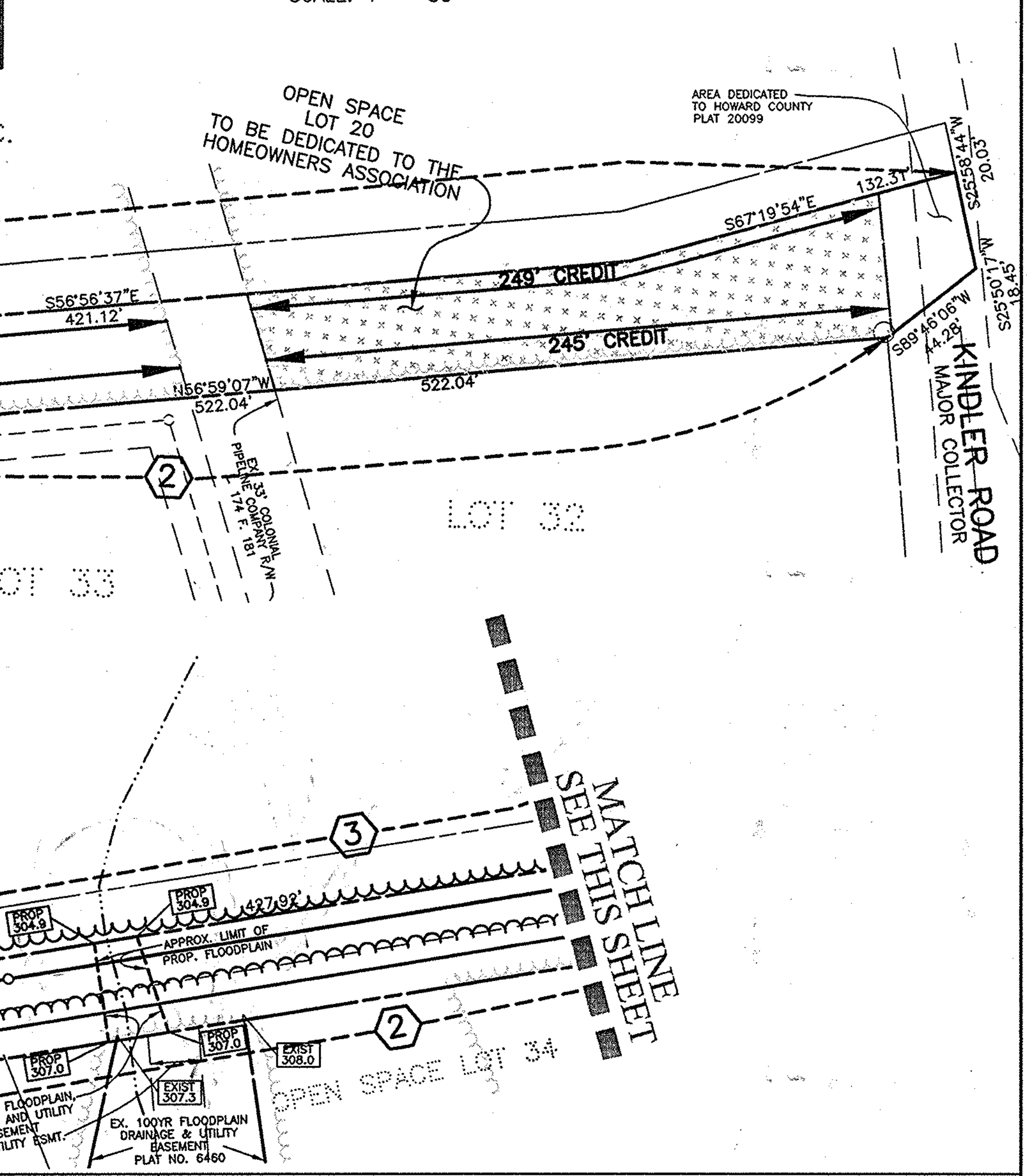
CATEGORY	ADJACENT TO ROADS		ADJACENT TO PERIMETER PROP.			TOTAL
LANDSCAPE TYPE	LOT 1 (B)	LOT 16 (B)	① A	② A	③ A	
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	220'	169'	581'	1140'	2121'	
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	YES*, 581'	YES*, 851'	YES*, 1,156'	
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO	NO	NO	
NUMBER OF PLANTS REQUIRED	220 L.F.	169 L.F.	0 L.F.	289 L.F.	965 L.F.	
SHADE TREES	5	4	–	5	16	30
EVERGREEN TREES	6	5	–	–	–	11
OTHER TREES (2:1 SUBSTITUTE)	–	–	–	–	–	–
SHRUBS	–	–	–	–	–	–
NUMBER OF PLANTS PROVIDED						
SHADE TREES	5	4	–	5	16	30
EVERGREEN TREES	6	5	–	–	–	11
OTHER TREES (2:1 SUBSTITUTE)	–	–	–	–	–	–
SHRUBS (10:1 SUBSTITUTE)	–	–	–	–	–	–
(DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)						

* PROPOSED BIO-SWALE PLANTINGS (3 TREES PER LOT)
** EXISTING WOODS OR PROPOSED FOREST CONSERVATION AREA WITH WIDTH 20' OR GREATER.

LANDSCAPE LEGEND	
SYMBOL	DESCRIPTION
(⊕) (◎) (·)	STREET TREES TO BE PROVIDED BY THE DEVELOPER
(+)	SHADE TREES ALONG PERIMETER TO BE PROVIDED BY THE DEVELOPER
(evergreen)	EVERGREEN TREES ALONG PERIMETER TO BE PROVIDED BY THE DEVELOPER

NOTE: LANDSCAPING SHOWN ON THIS PLAN IS IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. A SURETY IN THE AMOUNT OF $10,650 FOR 30 SHADE TREES AND 11 PINE TREES WILL BE POSTED WITH THE DEVELOPER'S AGREEMENT. STREET TREES WILL BE BONDED WITH THE ROADWAY CONSTRUCTION SURETY. LANDSCAPE SURETY POSTED WITH THE DEVELOPER'S AGREEMENT FOR THE ORIGINAL F-07-003 IS SUFFICIENT TO COVER THE NEWLY PROPOSED LANDSCAPING CHANGES ASSOCIATED WITH THE REDLINE REVISIONS.



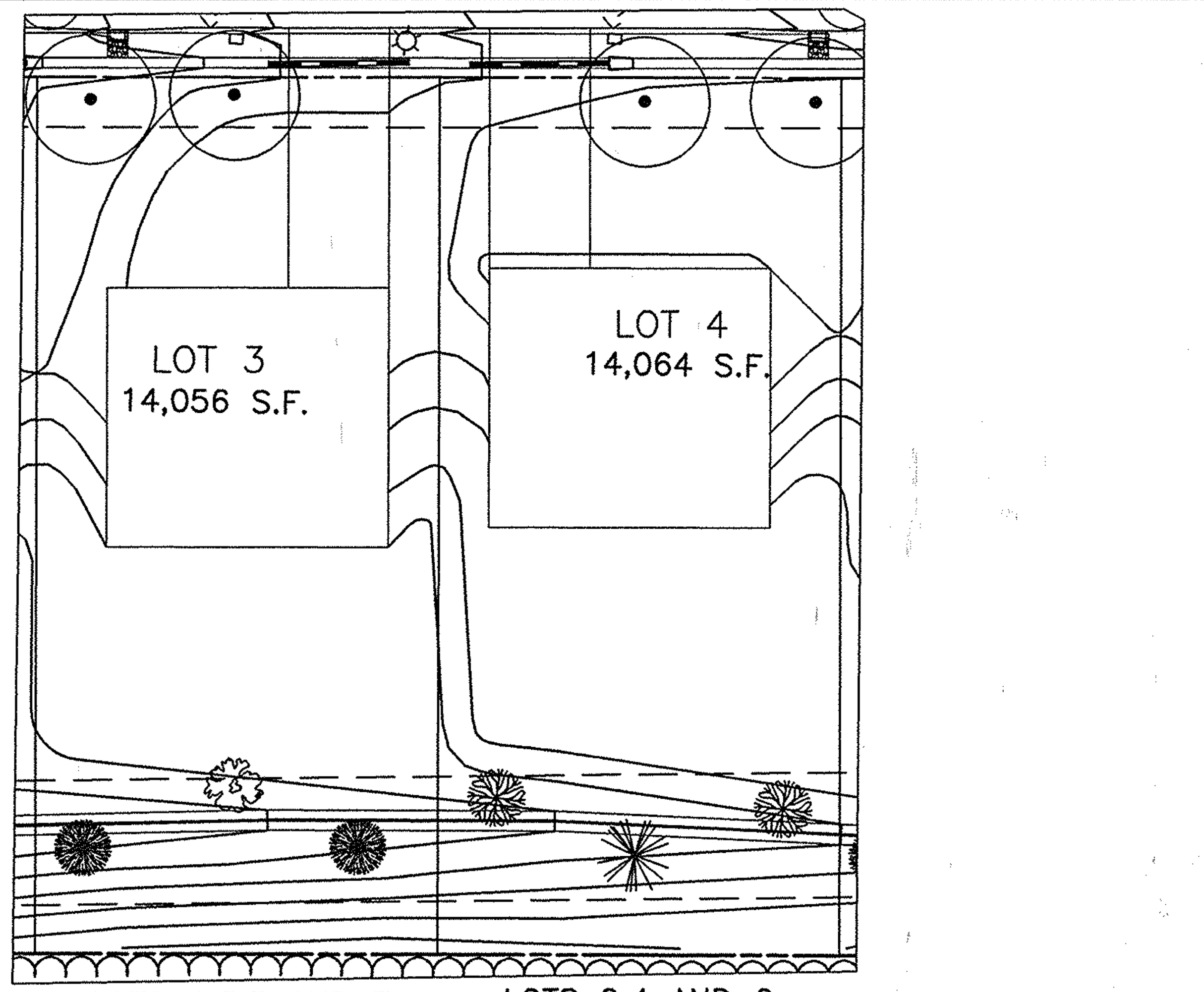


AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 9-18-14

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-14

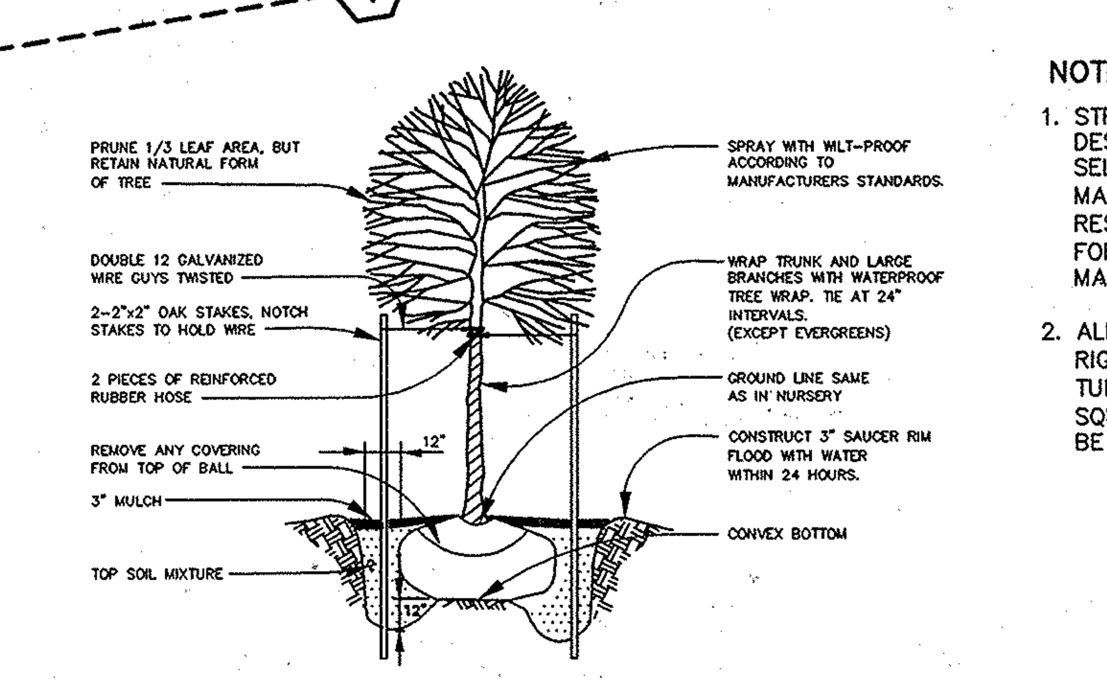
BIORETENTION PLANTING LOTS 2, 4 AND 6				
SYMBOL	QUANTITY PER LOT	QUANTITY TOTAL	NAME	REMARKS
(evergreen)	1	3	JUNIPERUS VIRGINIANA EASTERN RED CEDAR	6'–8' ht. UNSHEARED
(shrub)	2	6	PRUNIS VIRGINIANA CHOKE CHERRY	2 1/2" MIN. CAL. B&B

BIORETENTION PLANTING LOTS 1, 3, 5 AND 7				
SYMBOL	QUANTITY PER LOT	QUANTITY TOTAL	NAME	REMARKS
(●)	2	8	CHAMAECYPARIS THYOIDES ATLANTIC WHITE CEDAR	6'–8' ht. UNSHEARED
(tree)	1	4	BETULA ALLEGHANIENSIS YELLOW BIRCH	2 1/2" MIN. CAL. B&B



TYPICAL BIO-SWALE PLANTING LAYOUTS
SCALE: 1" = 30'

STREET LIGHTING CHART				
STREET NAME	STATION	OFFSET	FIXTURE/POLE TYPE	COMMENTS
KINDLER OVERLOOK DR	0+27	17'R	150 WATT HPS VAPOR PENDANT (CUTOFF) MOUNTED AT 30' ON A BRONZE FIBERGLASS POLE USING A 12' ARM	
KINDLER OVERLOOK DR	1+87	19'R	100 WATT HPS VAPOR PREMIER POST-TOP MOUNTED ON A 14' BLACK FIBERGLASS POLE	
KINDLER OVERLOOK DR	3+40	19'R	"	
KINDLER OVERLOOK DR	5+09	22'R	"	
KINDLER OVERLOOK DR	6+50	15'R	"	
KINDLER OVERLOOK DR	7+50	15'L	"	
KINDLER OVERLOOK DR	9+27	19'R	"	
TWIN OVERLOOK PLACE	2+55	13'R	"	
TWIN OVERLOOK PLACE	6+02	0'	"	



TREE PLANTING DETAIL
NOT TO SCALE

NOTE:

1. TREES SHOULD BE PLANTED A MINIMUM OF 6 FEET FROM THE EDGE OF PAVING AND MUST BE A MINIMUM OF 5 FEET FROM ANY STORM DRAIN.
2. TREES MUST BE PLANTED A MINIMUM OF 5 FEET FROM AN OPEN SPACE ACCESS STRIP AND 10 FEET FROM A DRIVEWAY.
3. SEE TREE PLANTING DETAIL – THIS SHEET.

NOTE:

1. STREETLIGHTS WILL BE REQUIRED IN THIS DEVELOPMENT IN ACCORDANCE WITH THE DESIGN MANUAL. STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SELECTED SHALL BE IN ACCORDANCE WITH THE LATEST HOWARD COUNTY DESIGN MANUAL, VOLUME III (1993) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL DEVELOPMENTS (JUNE 1993)." THE JUNE 1993 POLICY INCLUDES GUIDELINES FOR LATERAL AND LONGITUDINAL PLACEMENT. A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREETLIGHT AND ANY TREE.
2. ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-2 1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE) – 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — 12-1-10 DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — 12/06/10 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION — 12/3/10 DATE

NO.	DATE	REVISION
1	AUG 2010	REDESIGN TO INCORPORATE SWM ESD METHODS, REVISED BY SHEET SUBSTITUTION.

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
60 THOMAS JOHNSON DRIVE ▲ FREDERICK, MARYLAND 21702
(P) 301-371-3505 (F) 301-371-3506
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Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22390 Expiration Date: 6/3/11

OWNER/DEVELOPER:
HB DEVELOPMENT, INC.
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20723
410-792-2565

PROJECT: KINDLER OVERLOOK
LOTS 1–19 AND OPEN SPACE 20
REVISED FINAL ROAD CONSTRUCTION PLAN

LOCATION: TAX MAP: 41 GRID: 18 PARCEL 385, 395, P/O PARCEL 401 ZONED: R-20
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: FINAL ROAD AND LANDSCAPE PLAN

DATE: JUL 2006 / AUGUST 2010 — PROJECT NO. 1328
DESIGN: AAM — DRAFT: MAN — CHECK: CAM — SCALE: AS SHOWN — SHEET 2 OF 13

AS-BUILT F-07-003

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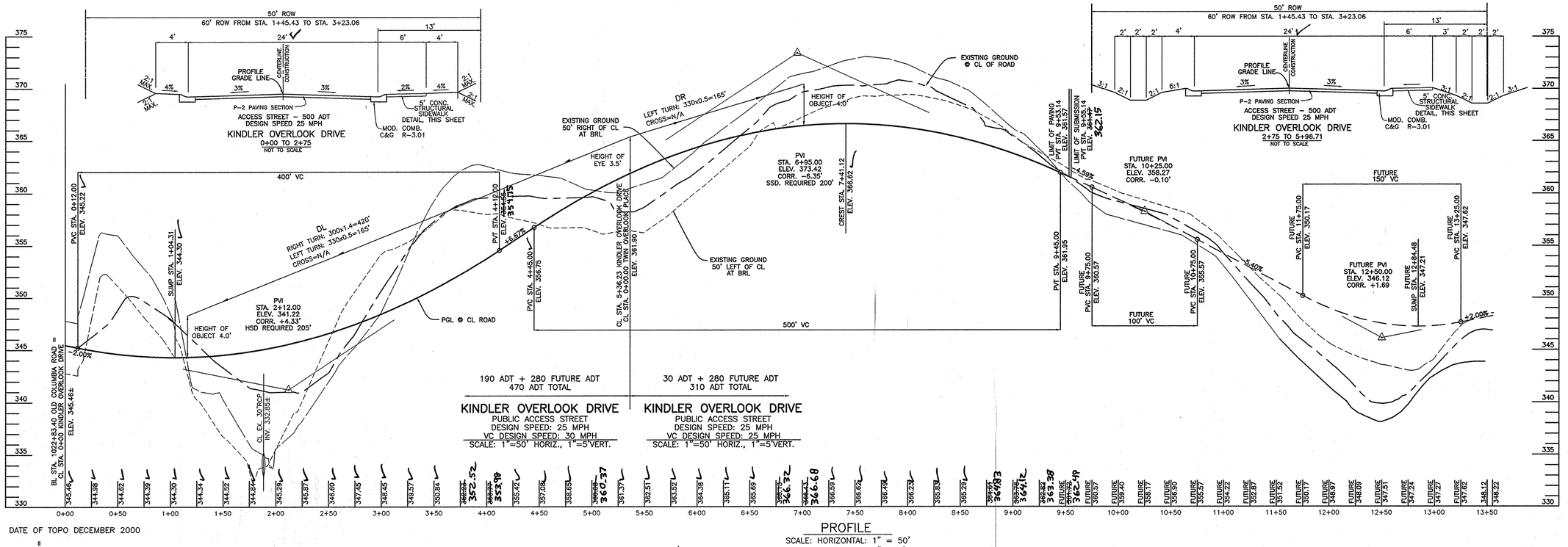
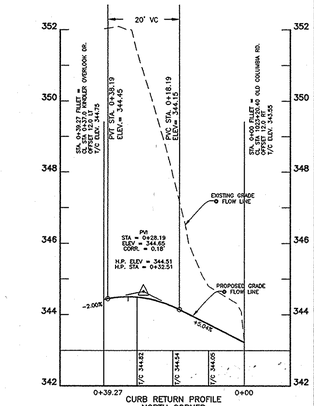
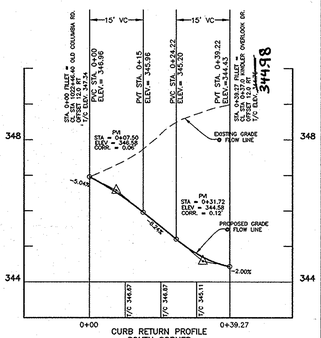
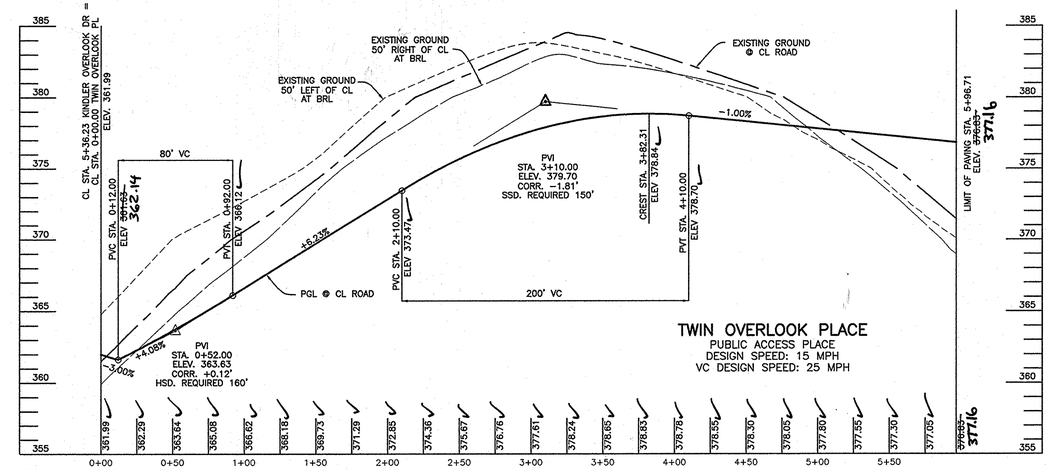
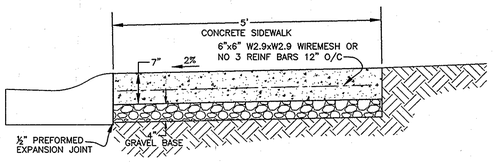






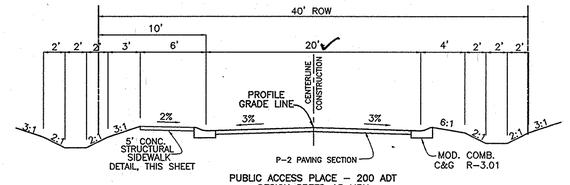




STRUCTURAL SIDEWALK DETAIL
NOT TO SCALE

NOTES:

1. SIDEWALK TO BE SCRIBED IN 5'–0" MAXIMUM SQUARES.
2. EXPANSION JOINTS ACROSS THE SIDEWALK NOT TO BE MORE THAN 15' APART.
3. ½" PREFORMED EXPANSION MATERIAL IN EXPANSION JOINTS TO BE KEPT ¼" BELOW SURFACE OF SIDEWALK.
4. CONCRETE TO BE MIX NO. 3.
5. WHERE SIDEWALK ABUTS CURB, SIDEWALK SHALL BE ¼" ABOVE CURB WITH ½" PREFORMED EXPANSION JOINT BEWTEEN SIDEWALK AND CURB.
6. ON LONGITUDINAL SIDEWALK GRADES OF 5% OR GREATER, A CONCRETE HEADER, 6" THICK AND 6" DEEP BELOW THE NORMAL 7" SIDEWALK THICKNESS SHALL BE CONSTRUCTED FOR THE FULL WIDTH OF THE SIDEWALK AT INTERVALS OF 48 FEET. THE HEADERS SHALL BE PLACED AT THE EXPANSION JOINT LOCATIONS AND SHALL BE MONOLITHIC WITH THE SIDEWALK.



AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 9-18-14

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-14

P–2 PAVING DETAIL

SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATIO (CBR)	3 TO <5	5 TO <7	≥7	3 TO <5	5 TO <7	≥7
		PAVEMENT MATERIAL (INCHES)	MIN HMA WITH GAB			HMA WITH CONSTANT GAB		
P–2	PARKING DRIVE AISLES: RESIDENTIAL AND NON–RESIDENTIAL WITH NO MORE THAN 10 HEAVY TRUCKS PER DAY LOCAL ROADS: ACCESS PLACE, ACCESS STREET CUL–DE–SAC: RESIDENTIAL	HMA SUPERPAVE FINAL SURFACE 9.5 MM PG 64–22, LEVEL 1 (LOW ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		HMA SUPERPAVE INTERMEDIATE SURFACE 9.5 MM PG 64–22, LEVEL 1 (LOW ESAL)	1.0	1.0	1.0	1.0	1.0	1.0
		HMA SUPERPAVE BASE 19.0 MM PG 64–22, LEVEL 1 (LOW ESAL)	2.0	2.0	2.0	3.5	2.0	2.0
		GRADED AGGREGATE BASE (GAB)	8.0	4.0	3.0	4.0	4.0	4.0

HMA SUPERPAVE FINAL SURFACE
HMA SUPERPAVE INTERMEDIATE SURFACE
HMA SUPERPAVE BASE
GRADED AGGREGATE BASE (GAB)

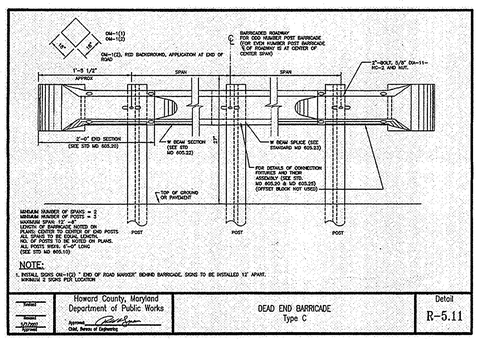
APPROVED: DEPARTMENT OF PUBLIC WORKS

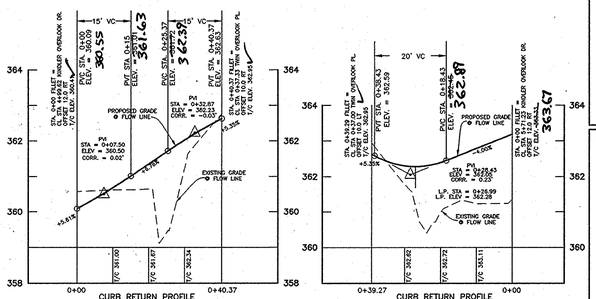
CHIEF, BUREAU OF HIGHWAYS — DATE 11-5-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 12/06/10

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 12/3/10





NO.	DATE	REVISION
1	AUG 2010	REDESIGN TO INCORPORATE SWM ESD METHODS, REVISED BY SHEET SUBSTITUTION.

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
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(P) 301–371–3505 (F) 301–371–3506
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STATE OF MARYLAND CHRISTOPHER ALAN MASON No. 22547 PROFESSIONAL ENGINEER 10/27/10

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22547 Expiration Date: 6-30-11

OWNER/DEVELOPER:
HB DEVELOPMENT, INC.
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20723
410–792–2565

PROJECT:
KINDLER OVERLOOK
LOTS 1–19 AND OPEN SPACE LOT 20
REVISED FINAL ROAD CONSTRUCTION PLAN

LOCATION: TAX MAP: 41 PARCEL 385, 395, P/O 401 GRID: 18 ZONED: R–20
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: FINAL ROAD PROFILES

DATE: JUL 2006 / AUGUST 2010 PROJECT NO. 1328

DESIGN: DBT/AAM | DRAFT: MAN | CHECK: CAM

SCALE: AS SHOWN SHEET 3 OF 13

AS-BUILT F–07–003

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PLAN VIEW
SCALE: 1" = 50'

THIS PLAN IS FOR STORMDRAIN DRAINAGE AREAS ONLY

No As-Built information is required on this sheet

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-14

9-18-14

STORM DRAIN DATA

INLET NO.	DRAINAGE AREA (AC)	% IMPERVIOUS	ZONING	C FACTOR	tc (MIN.)*
1	0.65	39	R-20	0.45	10
2	0.29	36	R-20	0.44	10
3	0.10	38	R-20	0.45	10
4	0.20	46	R-20	0.50	10
5	0.20	48	R-20	0.52	10
6	0.76	32	R-20	0.45	10
7	1.17	24	R-20	0.41	10
8	0.12	73	R-20	0.68	10
9	0.26	65	R-20	0.63	10

*ASSUMED 10 MINUTE MINIMUM tc FOR RESIDENTIAL DEVELOPMENT.

SOILS LEGEND

MAP SYMBOL	SOIL TYPE	MAPPING UNIT
Ba *	D	BAILE SILT LOAM
GIB2	B	GLENELG LOAM – 3 TO 8 PERCENT SLOPES – MODERATELY ERODED
GIC2	B	GLENELG LOAM – 8 TO 15 PERCENT SLOPES – MODERATELY ERODED
MgB2	B	MANOR GRAVELLY LOAM – 3 TO 8 PERCENT SLOPES – MODERATELY ERODED
MgC2	B	MANOR GRAVELLY LOAM – 8 TO 15 PERCENT SLOPES – MODERATELY ERODED
MgC3	B	MANOR GRAVELLY LOAM – 8 TO 15 PERCENT SLOPES – SEVERELY ERODED
MIB2	B	MANOR LOAM – 3 TO 8 PERCENT SLOPES – MODERATELY ERODED
MIC2	B	MANOR LOAM – 8 TO 15 PERCENT SLOPES – MODERATELY ERODED
MID2	B	MANOR LOAM – 15 TO 25 PERCENT SLOPES – MODERATELY ERODED
MIE	B	MANOR LOAM – 25 TO 40 PERCENT SLOPES
MnF	B	MANOR VERY STONEY LOAM – 25 TO 60 PERCENT SLOPES

* INDICATES HYDRIC SOILS
HO. CO. SOILS MAP No.29

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — 12-1-10 — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — 12/06/10 — DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION — 12/3/10 — DATE

NO.	DATE	REVISION
2	3-10-15	REGRADE SWALE AND REMOVE DRIVEWAY CULVERT ON LOTS 6 & 12
1	AUG 2010	REVISED SWM TO ESD PRACTICES, RESULTING IN COMPLETE SHEET SUBSTITUTION.

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License No. 22390 Expiration Date: 6/30/11

6/15/10

OWNER/DEVELOPER:
HB DEVELOPMENT, INC.
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20723
410-792-2565

PROJECT:
KINDLER OVERLOOK
LOTS 1–19 AND OPEN SPACE 20
REVISED FINAL ROAD CONSTRUCTION PLAN

LOCATION: TAX MAP: 41 PARCEL 385, 395, P/O 401
GRID: 18 ZONED: R-20
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE:
FINAL STORMDRAIN DRAINAGE AREA MAP

DATE: JUL 2006 / AUGUST 2010 — PROJECT NO. 1328

DESIGN: AAM | DRAFT: MAN | CHECK: CAM | SCALE: AS SHOWN | SHEET 4 OF 13

AS-BUILT F-07-003

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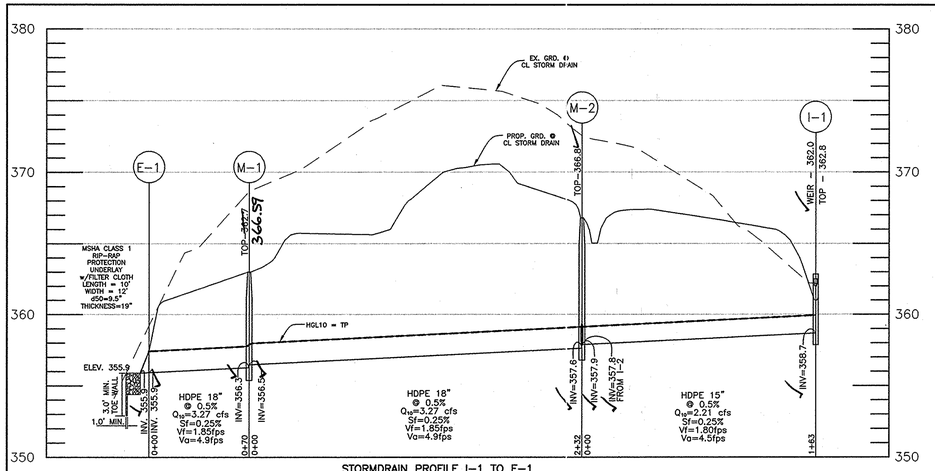
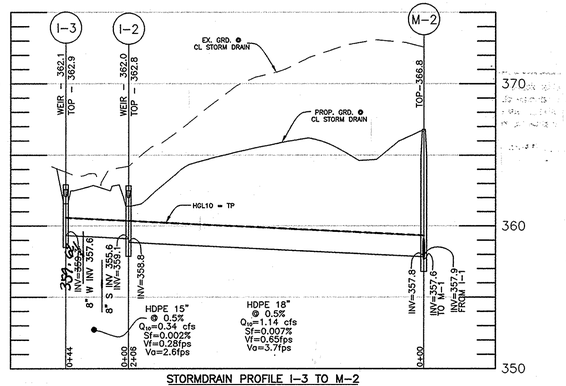
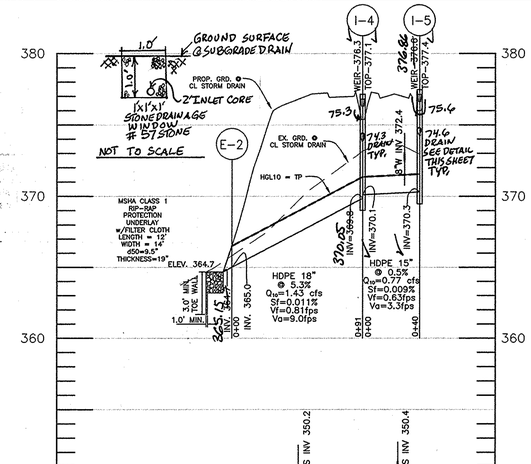


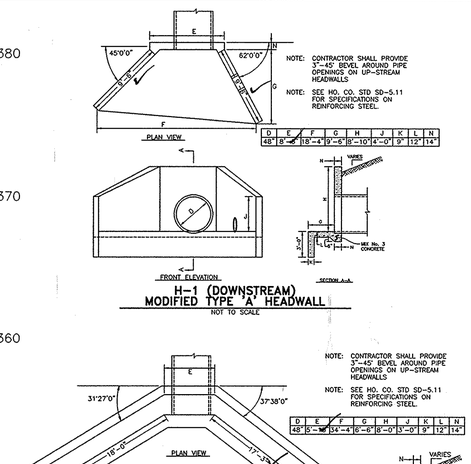
STORMDRAIN PROFILE I-1 TO E-1
SCALE: HORIZONTAL: 1" = 50'
VERTICAL: 1" = 5'



STORMDRAIN PROFILE I-3 TO M-2
SCALE: HORIZONTAL: 1" = 50'
VERTICAL: 1" = 5'



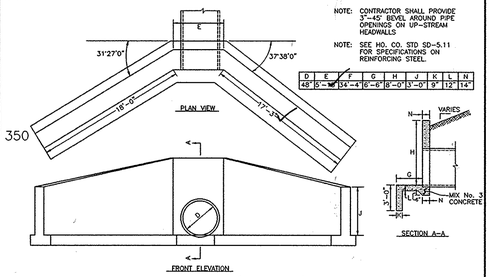
STORMDRAIN PROFILE I-5 TO E-2
SCALE: HORIZONTAL: 1" = 50'
VERTICAL: 1" = 5'



NOTE: CONTRACTOR SHALL PROVIDE 3"-45° BEVEL AROUND PIPE OPENINGS ON UP-STREAM HEADWALLS

NOTE: SEE HO. CO. STD SD-5.11 FOR SPECIFICATIONS ON REINFORCING STEEL.

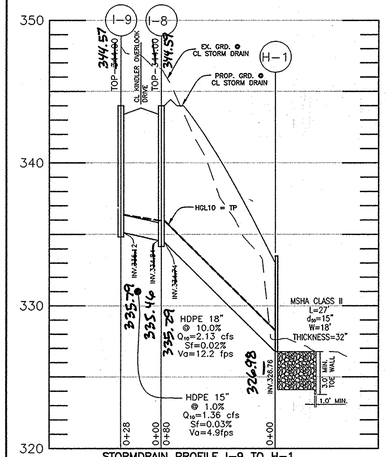
H-1 (DOWNSTREAM)
MODIFIED TYPE 'A' HEADWALL
NOT TO SCALE



NOTE: CONTRACTOR SHALL PROVIDE 3"-45° BEVEL AROUND PIPE OPENINGS ON UP-STREAM HEADWALLS

NOTE: SEE HO. CO. STD SD-5.11 FOR SPECIFICATIONS ON REINFORCING STEEL.

H-2 (UPSTREAM)
MODIFIED TYPE 'A' HEADWALL
NOT TO SCALE



STORMDRAIN PROFILE I-9 TO H-1
SCALE: HORIZONTAL: 1" = 50'
VERTICAL: 1" = 5'

CONSTRUCTION SPECIFICATIONS

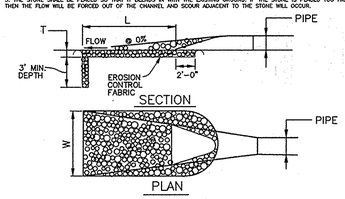
1. THE SUBGRADE FOR THE FILTER, RIP-RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.

2. THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER.

3. GEOTEXTILE CLASS C28 OR BETTER SHALL BE PROTECTED FROM PUNCHING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE REPAIRED BY PLACING ANOTHER PIECE OF GEOTEXTILE FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. ALL OVERLAPS WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE FABRIC SHALL BE A MINIMUM OF ONE FOOT.

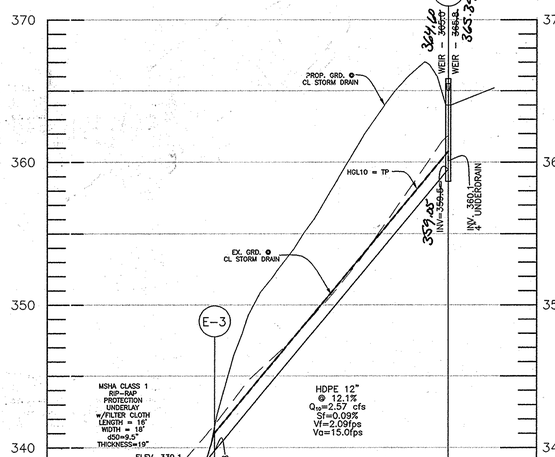
4. STONE FOR THE RIP-RAP OR GABION OUTLETS MAY BE PLACED BY EQUIPMENT, THEY SHALL BE CONSTRUCTED TO THE FULL COURSE PRIC THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. THE STONE FOR HE RIP-RAP OR GABION OUTLETS SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. RIP-RAP SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE FABRIC. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.

5. THE STONE SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND. IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SCOUR ADJACENT TO THE STONE WILL OCCUR.

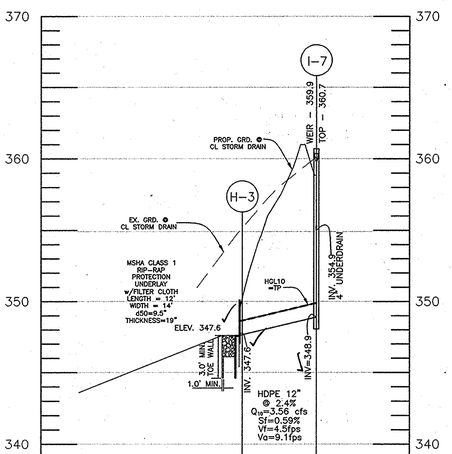


STRUCTURE	D-50	LENGTH (L)	WIDTH (W)	THICKNESS (T)	SHA CLASS
H-1	16"	27'	18'	32"	II
H-2	9.5"	12'	35'	19"	I
H-3	9.5"	12'	14'	19"	I
E-1	9.5"	10'	12'	19"	I
E-2	9.5"	12'	14'	19"	I
E-3	9.5"	16'	18'	19"	I

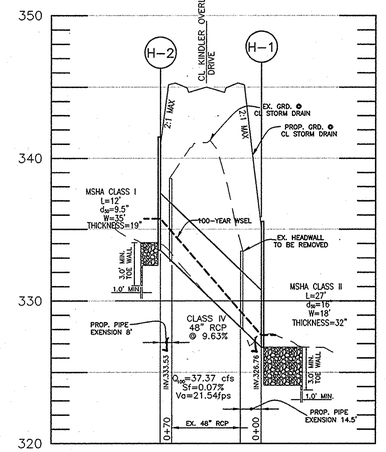
OUTLET PROTECTION DETAIL
NOT TO SCALE



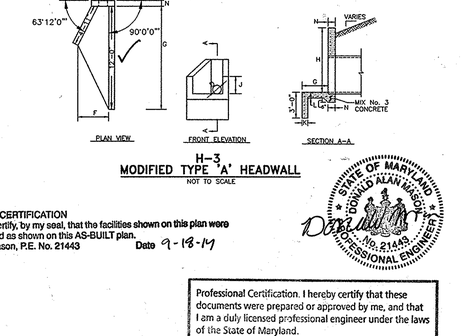
STORMDRAIN PROFILE I-6 TO E-4
SCALE: HORIZONTAL: 1" = 50'
VERTICAL: 1" = 5'
PRIVATE



STORMDRAIN PROFILE I-7 TO H-3
SCALE: HORIZONTAL: 1" = 50'
VERTICAL: 1" = 5'
PRIVATE



ENTRANCE ROAD CULVERT EXTENSION
SCALE: HORIZONTAL: 1" = 50'
VERTICAL: 1" = 5'

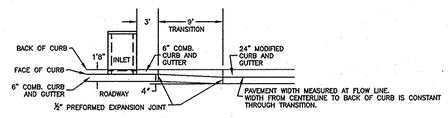


NOTE: CONTRACTOR SHALL PROVIDE 3"-45° BEVEL AROUND PIPE OPENINGS ON UP-STREAM HEADWALLS

NOTE: SEE HO. CO. STD SD-5.11 FOR SPECIFICATIONS ON REINFORCING STEEL.

H-3
MODIFIED TYPE 'A' HEADWALL
NOT TO SCALE

PIPE SCHEDULE			
SIZE	LENGTH	TYPE & CLASS	OWNER
48"	23 LF	RCP C. IV	PUBLIC
12"	215 LF	HDPE	PRIVATE
18"	679 LF	HDPE	PUBLIC
15"	276 LF	HDPE	PUBLIC



INLET TRANSITION DETAIL
NOT TO SCALE

STORM DRAIN STRUCTURE SCHEDULE						
NO	LOCATION	INV. IN	INV. OUT	TOP ELEV.	HO. CO. STD.	COMMENTS
I-1	CL STA. 5+63.86 KINDLER OVERLOOK DR. OFFSET 33.15'R	–	358.7 ✓	362.8 ✓	D 4.10 OR 4.11	4-OPENINGS
I-2	CL STA. 9+23.50 KINDLER OVERLOOK DR. OFFSET 24.12'R	359.1 ✓	358.8 ✓	362.8 ✓	D 4.10 OR 4.11	1-OPENING
I-3	CL STA. 9+21.62 KINDLER OVERLOOK DR. OFFSET 19.18'L	~~359.62~~ 359.8	362.9 ✓		D 4.10 OR 4.11	1-OPENING
I-4	CL STA. 5+63.00 TWIN OVERLOOK PLACE. OFFSET 22.14'L	370.1 ✓	~~369.8~~ 370.3 ✓	377.1 ✓	D 4.10 OR 4.11	1-OPENING
I-5	CL STA. 5+62.79 TWIN OVERLOOK PLACE. OFFSET 16.79'R	–	~~370.1~~ 370.3 ✓	377.4 ✓	D 4.10 OR 4.11	1-OPENING
I-6	N 544664.7440 E 1345400.4481	360.1	~~359.8~~ 360.5	~~365.8~~ 366.30	D 4.10 OR 4.11	4-OPENINGS
I-7	N 545030.0777 E 1344970.7610	354.9	~~108~~ 360.7 ✓	359.9 ✓	D 4.10 OR 4.11	4-OPENINGS
I-8	CL STA. 1+04.31 KINDLER OVERLOOK DR. OFFSET 12'L	~~335.46~~ 334.8	~~335.29~~ 334.7	~~344.0~~ 344.50	4.01 OR 4.02	
I-9	CL STA. 1+04.31 KINDLER OVERLOOK DR. OFFSET 12'R	–	~~335.79~~ 336.1	~~344.0~~ 344.50	4.01 OR 4.02	
M-1	N 545111.7819 E 1345458.7257	356.5 ✓	356.3 ✓	~~362.7~~ 366.59	G – 5.12	
M-2	CL STA. 7+26.89 KINDLER OVERLOOK DR. OFFSET 30.48'R	357.8	357.9 ✓	357.6 ✓	366.8 ✓	G – 5.12
E-1	N 545111.6014 E 1345534.7264	–	355.9 ✓	–	D – 5.51	
E-2	N 544785.9531 E 1345599.7466	–	~~364.7~~ 365.15		D – 5.51	
E-3	N 544549.8347 E 1345519.2524	–	~~339.1~~ 340.05		D – 5.51	
H-1	N 545216.5795 E 1344831.9552 N 545210.9252 E 1344834.7004	–	~~326.5~~ 326.98 ~~351.7~~ 326.81		MOD. TYPE 'A'–SEE DETAIL THIS SHEET	
H-2	N 545146.2622 E 1344806.8623	333.5 ✓	–	–	MOD. TYPE 'A'–SEE DETAIL THIS SHEET	
H-3	N 545060.0731 E 1344926.3657	347.6 ✓	–	–	MOD. TYPE 'A'–SEE DETAIL THIS SHEET	

1) STRUCTURE ELEVATION AND LOCATION FOR MANHOLES IS AT THE TOP AND CENTER OF RIM.
2) STRUCTURE ELEVATION AND LOCATION FOR INLETS IS AT THE TOP OF CURB AT MIDPOINT OF THE INLET OR AT THE CENTER OF SLAB FOR "D" INLETS.
3) STRUCTURE ELEVATION AND LOCATION FOR ENDSECTIONS IS AT CENTERLINE OF THE END OF THE END SECTION.
4) STRUCTURE ELEVATION AND LOCATION FOR HEADWALLS IS AT PIPE INVERT.
5) PRECAST STRUCTURES MEETING HS-20 LOADING MAY BE USED.
6) ALL STORM DRAINS SHALL BE SMOOTH CORE HIGH DENSITY POLYETHYLENE PIPE.

STRUCTURE SCHEDULE – FLOW THROUGH INLETS					
NO	LOCATION	TOP ELEV.	NO	LOCATION	TOP ELEV.
CI-1	CL STA. 2+81.61 KINDLER OVERLOOK DR. OFFSET 12.43'L	~~347.8~~ 350.55	SI-1	CL STA. 3+37.02 KINDLER OVERLOOK DR. OFFSET 12.40'R	~~350.3~~
CI-2	CL STA. 4+45.20 KINDLER OVERLOOK DR. OFFSET 12.42'L	~~356.0~~ 359.97	SI-2	CL STA. 4+85.12 KINDLER OVERLOOK DR. OFFSET 12.44'R	~~359.1~~
CI-3	CL STA. 5+73.23 KINDLER OVERLOOK DR. OFFSET 12.43'L	363.6	SI-3	CL STA. 5+85.23 KINDLER OVERLOOK DR. OFFSET 12.43'R	~~364.0~~ 364.42
CI-4	CL STA. 7+03.26 KINDLER OVERLOOK DR. OFFSET 12.43'L	~~366.5~~ 366.82	SI-4	CL STA. 7+04.38 KINDLER OVERLOOK DR. OFFSET 12.43'R	~~366.6~~ 366.24
CI-5	CL STA. 8+08.01 KINDLER OVERLOOK DR. OFFSET 12.44'L	366.2	SI-5	CL STA. 8+25.66 KINDLER OVERLOOK DR. OFFSET 12.43'R	~~366.0~~ 364.45
CI-6	CL STA. 8+80.24 KINDLER OVERLOOK DR. OFFSET 12.44'L	364.1	SI-6	CL STA. 8+95.89 KINDLER OVERLOOK DR. OFFSET 12.43'R	~~364.1~~ 364.50
CI-7	CL STA. 0+53.60 TWIN OVERLOOK PLACE. OFFSET 10.43'R	364.6	SI-7	CL STA. 0+53.60 TWIN OVERLOOK PLACE. OFFSET 10.34'L	~~364.0~~ 373.12
CI-8	CL STA. 1+92.71 TWIN OVERLOOK PLACE. OFFSET 10.43'R	~~372.6~~ 378.80	SI-8	CL STA. 1+92.71 TWIN OVERLOOK PLACE. OFFSET 10.43'L	~~372.6~~
CI-9	CL STA. 3+32.17 TWIN OVERLOOK PLACE. OFFSET 10.43'R	~~378.6~~ 378.53	SI-9	CL STA. 3+26.78 TWIN OVERLOOK PLACE. OFFSET 10.43'L	~~378.5~~
CI-10	CL STA. 4+85.24 TWIN OVERLOOK PLACE. OFFSET 10.43'R	378.5	SI-10	CL STA. 4+72.71 TWIN OVERLOOK PLACE. OFFSET 10.43'L	~~378.3~~
CI-11	CL STA. 5+96.04 TWIN OVERLOOK PLACE. OFFSET 15.50'L	~~376.7~~ 377.4			

1) STRUCTURE ELEVATION AND LOCATION FOR INLETS IS AT THE TOP OF CURB AT MIDPOINT OF THE INLET.
2) TRANSITIONS TO INLETS WILL BE PER HO. CO. R–3.06, REVISED TO MD 620.02 TYPE 'B' CURB (6"), WITH A 3' STRAIGHT CURB AND GUTTER SECTION, AND A 9' TRANSITION LENGTH.
3) INLETS SHALL BE MD 374.68, MODIFIED FOR 6" CURBS PER MD 374.55–01.
4) CURB INLETS (CI) SHALL BE 4'LONG, WITH A 3' OPENING, AND 2' WIDE FROM FACE OF CURB TO REAR INLET LIP.
5) SIDEWALK INLETS (SI) SHALL BE 4'LONG, WITH A 3' OPENING, AND 6.67' WIDE FROM FACE OF CURB TO REAR FACE.
6) EROSION PROTECTION SHALL CONSIST OF CLASS 1 RIPRAP, 19" THICK FROM BACK OF INLET TO BOTTOM OF SWALE.

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 12-1-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 12-06-10

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 12/3/10

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 9-18-14

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-14

NO.	DATE	REVISION
2	3-10-15	REGRADE SWALES AND REMOVE DRIVEWAY CULVERTS ON LOTS 6&12
1	AUG 2010	REDESIGN TO INCORPORATE SWM ESD METHODS, REVISED BY SHEET SUBSTITUTION.

BENCHMARK
ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
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WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — CHRISTOPHER ALAN MALKAMES — No. 22370 — PROFESSIONAL ENGINEER — 11/15/10

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 22370 Expiration Date: 6/2/12

OWNER/DEVELOPER:
HB DEVELOPMENT, INC.
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20723
410-792-2565

PROJECT:
KINDLER OVERLOOK
LOTS 1–19 AND OPEN SPACE 20
REVISED FINAL ROAD CONSTRUCTION PLAN

LOCATION: TAX MAP: 41 PARCEL: 385, 395, P/O PARCEL 401
GRID: 18 ZONED: R–20
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE:
FINAL STORMDRAIN PROFILES

DATE: JUL 2006 / AUGUST 2010 PROJECT NO. 1328

DESIGN: AAM DRAFT: MAN CHECK: CAM

SCALE: AS SHOWN SHEET 5 OF 13

AS-BUILT

F-07-003

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STREAM STABILIZATION RIPRAP MWCG 2.1

MATERIAL SPECIFICATIONS

Granular Filter Material Grading Specifications

% less than	U.S. Standard sieve size
100	2 ½ in (64 mm)
85-100	1 in (25 mm)
60-100	½ in (13 mm)
35-70	No. 10
20-50	No. 40
5-20	No. 200

The thickness of the filter should not be less than 6 inches (15 cm). Generally, filters that are one-half the thickness of the riprap layer are satisfactory.
Synthetic filter cloth may be used cautiously based on the *1994 MD Standards and Specifications for Soil Erosion and Sediment Control*.

Stone Gradations for Riprap Stone Classes

Class	Size	% Total Weight < Given Size
I	150 lb (70 kg)	100
	2 lb (1 kg)	10 max
II	700 lb (320 kg)	100
	20 lb (10 kg)	10 max
III	2000 lb (910 kg)	100
	40 lb (20 kg)	10 max

Uniform-grade riprap should incorporate angular rock to promote interlocking.

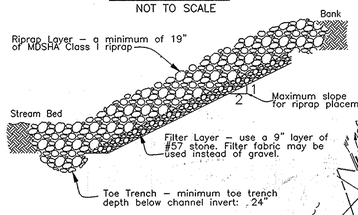
INSTALLATION GUIDELINES

All erosion and sediment control devices, including dewatering basins, should be implemented as the first order of
business according to a plan approved by the WMA or local authority. Once a slope stabilization project is initiated,
preparation and placement of the riprap should immediately follow the initial disturbance to minimize the chances
for further slope degradation. The recommended construction procedure for riprap is as follows beginning with
initial slope preparations (refer to Detail 2.1):

1. The contractor should install all sediment and erosion control devices as the first order of business.
2. Excavation should be made in reasonably close conformity with the existing stream slope and bed.
3. All fill in the subgrade should be compacted to a density approximating that of the surrounding undisturbed material.
4. Provisions must be made to anchor the riprap at the stream bed so as to provide protection against undermining. If this cannot be accomplished by creating a toe trench, an alternative method of protection must receive prior written approval from the WMA or local authority.
5. The filter layer or blanket should be placed immediately after slope preparation. The stone for granular filters should be spread in a uniform layer to the specified depth. Where more than one layer is employed, they should be spread such that there is minimal mixing. When cloth filters are used, special care should be taken not to damage the fabric during riprap placement.
6. Riprap placement should begin with the toe. The larger stones, as specified by the design gradation, should be placed in the toe and along the perimeter of the slope and channel protection. The riprap should be placed with suitable equipment in such a manner as to produce a reasonably graded mass of stones with zero drop height. The placing of stones that cause extensive segregation is not allowed. Where appropriate, a low flow channel shall be constructed through the riprap.
7. Any excavation voids existing along the edges of the completed slope and channel protection should be backfilled and compacted.
8. All disturbed areas should be permanently stabilized in accordance with an approved sediment and erosion control plan.

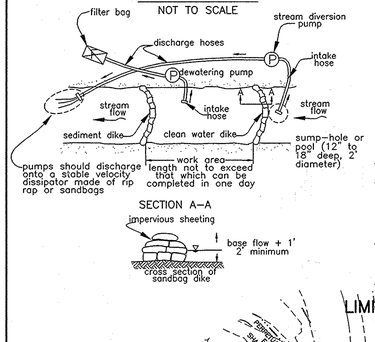
STREAM STABILIZATION RIPRAP MWCG DETAIL 2.1

NOT TO SCALE



PUMP AROUND PRACTICE MWCG DETAIL 1.2

NOT TO SCALE



PUMP AROUND PRACTICE MWCG 1.2

IMPLEMENTATION SEQUENCE

Sediment control measures, pump-around practices, and associated channel and bank construction should be completed in the following sequence (refer to Detail 1.2, this sheet):

1. Construction activities including the installation of erosion and sediment control measures should not begin until all necessary easements and/or right-of-ways have been acquired. All existing utilities should be marked in the field prior to construction. The contractor is responsible for any damage to existing utilities that may result from construction and should repair the damage at his/her own expense to the county's or utility company's satisfaction.
2. The contractor should notify the Maryland Department of the Environment or WMA sediment control inspector at least 5 days before beginning construction. Additionally, the contractor should inform the local environmental protection and resource management inspection and enforcement division and the provider of local utilities a minimum of 48 hours before starting construction.
3. The contractor should conduct a pre-construction meeting on site with the WMA sediment control inspector, the county project manager, and the engineer to review limits of disturbance, erosion and sediment control requirements, and the sequence of construction. The contractor should stake out all limits of disturbance prior to the pre-construction meeting so they may be reviewed. The participants will also designate the contractor's staging areas and flag all trees within the limit of disturbance which will be removed for construction access. Trees should not be removed within the limit of disturbance without approval from the WMA or local authority.
4. Construction should not begin until all sediment and erosion control measures have been installed and approved by the engineer and the sediment control inspector. The contractor should stay within the limits of the disturbance as shown on the plans and minimize disturbance within the work area whenever possible.
5. Upon installation of all sediment control measures and approval by the sediment control inspector and the local environmental protection and resource management inspection and enforcement division, the contractor should begin work at the upstream section and proceed downstream beginning with the establishment of stabilized construction entrances. In some cases, work may begin downstream if appropriate. The sequence of construction must be followed unless the contractor gets written approval for deviations from the WMA or local authority. The contractor should only begin work in an area which can be completed by the end of the day including grading adjacent to the channel. At the end of each work day, the work area must be stabilized and the pump around removed from the channel. Work should not be conducted in the channel during rain events.
6. Sandbag dikes should be situated at the upstream and downstream ends of the work area as shown on the plans, and stream flow should be pumped around the work area. The pump should discharge onto a stable velocity dissipater made of riprap or sandbags.
7. Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains back into the channel below the downstream sandbag dike.
8. Traversing a channel reach with equipment within the work area where no work is proposed should be avoided. If equipment has to traverse such a reach for access to another area, then timber mats or similar measures should be used to minimize disturbance to the channel. Temporary stream crossings should be used only when necessary and only where noted on the plans or specified. (*See Section 4, Stream Crossings, Maryland Guidelines to Waterway Construction*).
9. All stream restoration measures should be installed as indicated by the plans and all banks graded in accordance with the grading plans and typical cross-sections. All grading must be stabilized at the end of each day with seed and mulch or seed and matting as specified on the plans. 10. After an area is completed and stabilized, the clean water dike should be removed. After the first sediment flush, a new clean water dike should be established upstream from the old sediment dike. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike should be removed.
11. A pump around must be installed on any tributary or storm drain outfall which contributes baseflow to the work area. This should be accomplished by locating a sandbag dike at the downstream end of the tributary or storm drain outfall and pumping the stream flow around the work area. This water should discharge onto the same velocity dissipater used for the main stem pump around.
12. If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump around practices, should follow the same sequence as for the main stem of the river or stream. When construction on the tributary is completed, work on the main stem should resume. Water from the tributary should continue to be pumped around the work area in the main stem.
13. The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.
14. After construction, all disturbed areas should be regraded and revegetated as per the planting plan.

UTILITY INSTALLATION SPECIFICATIONS

1. THE CONTRACTOR SHOULD ONLY BEGIN WORK IN AN AREA WHICH CAN BE COMPLETED BY THE END OF THE DAY. AT THE END OF EACH WORK DAY, THE WORK AREA MUST BE STABILIZED AND THE PUMP AROUND REMOVED FROM THE CHANNEL. WORK SHOULD NOT BE CONDUCTED IN THE CHANNELS DURING RAIN EVENTS.
2. INSTALL SANDBAG DIKES UPSTREAM AND DOWNSTREAM OF PROPOSED UTILITY CUT. SANDBAG DIKE SHOULD BE A MINIUMUM OF 2' IN HEIGHT.
3. STREAM FLOW SHOULD BE PUMPED AROUND THE WORK AREA AS SHOWN IN MGWC DETAIL 1.2. THE PUMP SHOULD DISCHARGE ONTO A STABLE VELOCITY DISSIPATER MADE OF RIPRAP OR SANDBAGS.
4. WATER FROM THE WORK AREA SHOULD BE PUMPED AND DISCHARGED THROUGH AN APPROVED FILTER BAG OR OTHER APPROVED DEVICE. THE DEVICE SHOULD BE LOCATED SUCH THAT THE WATER DRAINS BACK INTO THE CHANNEL BELOW THE DOWNSTREAM SANDBAG DIKE.
5. UTILITIES SHOULD BE INSTALLED AT A MINIMUM OF 3' BELOW THE STREAM BED.
6. THE DISTURBED STREAM BANK SHALL BE PERMANENTLY STABILIZED AS SHOWN IN MGWC DETAIL 2.1, RING A 46" LAYER OF CLASS III RIPRAP AT CROSSING 1, AND A 19" LAYER OF CLASS I RIPRAP AT CROSSING 2.

CULVERT EXTENSION SPECIFICATIONS

1. THE CONTRACTOR SHOULD TAKE CARE TO LIMIT INSTREAM WORK TO THAT WHICH CAN BE COMPLETED BEFORE A RAIN EVENT IS ANTICIPATED. WHEN A RAIN EVENT IS EXPECTED, THE WORK AREA MUST BE STABILIZED AND THE PUMP AROUND REMOVED FROM THE CHANNEL. WORK SHOULD NOT BE CONDUCTED IN THE CHANNELS DURING RAIN EVENTS.
2. WHEN PUMP AROUND IS REMOVED, STREAM BANK AND BOTTOM STABILIZATION SHALL CONSIST OF RIPRAP (MWCG 2.1).
3. INSTALL SANDBAG DIKES UPSTREAM AND DOWNSTREAM OF EXISTING CULVERT AND THE PROPOSED CULVERT EXTENSIONS. (UPSTREAM) CLEAN WATER SANDBAG DIKE SHOULD BE A MINIUMUM OF 3' IN HEIGHT. DOWNSTREAM DIKE SHOULD BE 2' IN HEIGHT.
4. STREAM FLOW SHOULD BE PUMPED AROUND THE WORK AREA AS SHOWN IN MGWC DETAIL 1.2., EXCEPT THAT THE CONVEYANCE PIPE SHOULD BE LAID OR HUNG INSIDE THE EXISTING CULVERT, TO ALLOW MAINTENANCE OF TRAFFIC ON THE EXISTING DRIVE. THE PIPE SHOULD BE A MINIMUM OF 12" IN DIAMETER. THE PIPE SHOULD INCLUDE SUFFICIENT JOINTS AND VALVING TO REMOVE SECTIONS IN ORDER TO PLACE CULVERT EXTENSION SECTIONS. THE PUMP SHOULD BE CAPABLE OF CONVEYING 13 CFS (2–YEAR STORM). THE SYSTEM SHOULD DISCHARGE ONTO A STABLE VELOCITY DISSIPATER MADE OF RIPRAP OR SANDBAGS.
5. WATER FROM THE WORK AREA SHOULD BE PUMPED AND DISCHARGED THROUGH AN APPROVED FILTER BAG OR OTHER APPROVED DEVICE. THE DEVICE SHOULD BE LOCATED SUCH THAT THE WATER DRAINS BACK INTO THE CHANNEL BELOW THE DOWNSTREAM SANDBAG DIKE.
6. ALL EXCAVATED MATERIAL SHOULD BE DEPOSITED AND STABILIZED IN AN APPROVED AREA OUTSIDE OF THE FLOODPLAIN ON THE PROJECT SITE.

PLAN VIEW
SCALE: 1" = 50'

No As-Built information is required on this sheet

I Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-14

STATE OF MARYLAND · DONALD ALAN MUSSER · No. 21443 · PROFESSIONAL ENGINEER
11-13-14

LEGEND:

EXISTING CONTOURS 360
PROPOSED CONTOURS 360
EXISTING SANITARY
EXISTING WATER MAIN
PROPOSED STORM DRAIN
STABILIZED CONSTRUCTION ENTRANCE (SCE)
SILT FENCE SF SF
SUPER SILT FENCE SSF
EARTH DIKE
LIMIT OF DISTURBANCE
STANDARD INLET PROTECTION SP
EROSION CONTROL MATTING
SANDBAG DIKE
PUMP P
FILTER BAG F
SOIL DELINEATION
SOIL TYPE GIB2

DETAIL D
SEWER CROSSING 1

SCALE: 1" = 10'

DETAIL C
SEWER CROSSING 2

SCALE: 1" = 10'

DETAIL A
DOWNSTREAM SEDIMENT DIKE PLACEMENT

SCALE: 1" = 20'

DETAIL B
UPSTREAM CLEAN WATER DIKE PLACEMENT

SCALE: 1" = 20'

SOILS LEGEND

MAP SYMBOL	SOIL TYPE	MAPPING UNIT
Bo *	D	BAILE SILT LOAM
GIB2	B	GLENELG LOAM – 3 TO 8 PERCENT SLOPES – MODERATELY ERODED
GIC2	B	GLENELG LOAM – 8 TO 15 PERCENT SLOPES – MODERATELY ERODED
MgB2	B	MANOR GRAVELLY LOAM – 3 TO 8 PERCENT SLOPES – MODERATELY ERODED
MgC2	B	MANOR GRAVELLY LOAM – 8 TO 15 PERCENT SLOPES – MODERATELY ERODED
MgC3	B	MANOR GRAVELLY LOAM – 8 TO 15 PERCENT SLOPES – SEVERELY ERODED
MIB2	B	MANOR LOAM – 3 TO 8 PERCENT SLOPES – MODERATELY ERODED
MIC2	B	MANOR LOAM – 8 TO 15 PERCENT SLOPES – MODERATELY ERODED
MID2	B	MANOR LOAM – 15 TO 25 PERCENT SLOPES – MODERATELY ERODED
MIE	B	MANOR LOAM – 25 TO 40 PERCENT SLOPES
MaF	B	MANOR VERY STONEY LOAM – 25 TO 60 PERCENT SLOPES

* INDICATES HYDRIC SOILS — HO. CO. SOILS MAP No.29

ENGINEER'S CERTIFICATE

"I HEREBY CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

ENGINEER — DATE 11-15-10

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON–SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

DEVELOPER — DATE 11/15/10

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SCD — DATE 11/16/10

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 12-1-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 12/06/10

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 12/1/10

NO.	DATE	REVISION
1	AUG 2010	REDESIGN TO INCORPORATE SWM ESD METHODS, REVISED BY SHEET SUBSTITUTION.

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
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60 THOMAS JOHNSON DRIVE ▲ FREDERICK, MARYLAND 21702
(P) 301–371–3505 (F) 301–371–3506
WWW.BD–CIVILENGINEERING.COM

STATE OF MARYLAND · CHRISTOPHER ALAN MALFATTI · No. 23376 · REGISTERED PROFESSIONAL ENGINEER
11/15/10

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 23376 Expiration Date: 6/30/11

OWNER/DEVELOPER:
HB DEVELOPMENT, INC.
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20723
410–792–2565

PROJECT:
KINDLER OVERLOOK
LOTS 1–19 AND OPEN SPACE 20
REVISED FINAL ROAD CONSTRUCTION PLAN

LOCATION: TAX MAP:41 PARCEL 385, 395, P/O PARCEL 401
GRID: 18 ZONED: R–20
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: MASS GRADING, SEDIMENT AND EROSION CONTROL PLAN

DESIGN: AAM | DRAFT: MAN | CHECK: CAM

DATE: JUL 2006 / AUGUST 2010 | PROJECT NO. 1328

SCALE: AS SHOWN | SHEET 6 OF 13

AS-BUILT

F–07–003

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PERMANENT SEEDBED PREPARATIONS

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: IN LIEU OF SOIL TEST RECOMMENDATIONS, USE ON OF THE FOLLOWING SCHEDULES:

1. PREFERRED – APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ FT) AND 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ FT) BEFORE SEEDING. HARROW OR DISC INTO UPPER THREE INCHES OF SOIL. AT TIME OF SEEDING, APPLY 400 LBS PER ACRE 30-0-0- UREAFORM FERTILIZER (9 LBS/1000 SQ FT).
2. ACCEPTABLE – APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ FT) AND 1000 LBS PER ACRE 10-10-10 FERTILIZER (23 LBS/1000 SQ FT) BEFORE SEEDING. HARROW OR DISC INTO UPPER THREE INCHES OF SOIL.

SEEDING: FOR THE PERIODS MARCH 1 THROUGH APRIL 30 AND AUGUST 1 THROUGH OCTOBER 15, SEED WITH 60 LBS PER ACRE (1.4 LBS/1000 SQ FT) OF KENTUCKY 31 TALL FESCUE PER ACRE AND 2 LBS PER ACRE (.05 LBS/1000 SQ FT) OF WEEPING LOVEGRASS. DURING THE PERIOD OF OCTOBER 16 THROUGH FEBRUARY 28, PROTECT SITE BY: OPTION (1) 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING. OPTION (2) USE SOD. OPTION (3) SEED WITH 60 LBS PER ACRE OF KENTUCKY 31 TALL FESCUE AND MULCH WITH 2 TONS PER ACRE OF WELL ANCHORED STRAW.

MULCHING: APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ FT) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GALLONS PER ACRE (5 GAL/1000 SQ FT) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPES 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ FT) FOR ANCHORING.

MAINTENANCE: INSPECT ALL SEEDED AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDINGS.

TEMPORARY SEEDBED PREPARATIONS

APPLY TO GRADED OR CLEARED AREAS LIKELY TO BE REDISTURBED WHERE A SHORT-TERM VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: APPLY 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ FT).

SEEDING: FOR PERIOD MARCH 1 THROUGH APRIL 30 AND FROM AUGUST 15 THROUGH NOVEMBER 15, SEED WITH 2-1/2 BUSHELS PER ACRE OF ANNUAL RYE (3.2 LBS/1000 SQ FT). FOR THE PERIOD MAY 1 THROUGH AUGUST 14, SEED WITH 3 LBS PER ACRE OF WEEPING LOVEGRASS (.07 LBS/1000 SQ FT). FOR THE PERIOD NOVEMBER 16 THROUGH FEBRUARY 28, PROTECT SITE BY APPLYING 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOD.

MULCHING: APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ FT) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GALLONS PER ACRE (5 GAL/1000 SQ FT) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPES, 8 FT. OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ FT) FOR ANCHORING.

REFER TO THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR RATE AND METHODS NOT COVERED.

SEDIMENT CONTROL NOTES

1. A MINIMUM OF 24 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTION, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION, (313-1850).
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT "MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL", REVISIONS THERETO.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 12, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDINGS (SEC. 51) SOD (SEC. 54), TEMPORARY SEEDING (SEC. 50) AND MULCHING (SEC. 52). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
6. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
7. SITE ANALYSIS:

TOTAL AREA OF SITE	11.5	ACRES
AREA DISTURBED	9.5	ACRES
AREA TO BE ROOFED OR PAVED	2.4	ACRES
AREA TO BE VEGETATIVELY STABILIZED	9.5	ACRES
TOTAL CUT	32,093	CY*
TOTAL FILL	25,928	CY*
OFFSITE WASTE AREA LOCATION	SITE WITH APPROVED SEDIMENT CONTROL PLAN AND PERMIT	

* CUT/FILL QUANTITIES ARE FOR SEDIMENT CONTROL PURPOSES ONLY. CONTRACTOR SHALL PERFORM THEIR OWN EARTHWORK CALCULATIONS FOR SITE BALANCING.

8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
9. ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
11. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH CAN BE BACK FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.

TOPSOIL SPECIFICATIONS

I. Topsoil salvaged from the existing site may be used provided that it meets that standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-SCS in cooperation with Maryland Agricultural Experimental Station.

II. Topsoil Specifications – Soil to be used as topsoil must meet the following:

i. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting texture subsoils and shall contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1-1/2" in diameter.

ii. Topsoil must be free of plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nutsedge, poison ivy, thistle, or others as specified.

iii. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.

III. For sites having disturbed areas under 5 acres:

i. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization – Section I – Vegetative Stabilization Methods and Materials.

IV. For sites having disturbed areas over 5 acres:

i. On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:

a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher.
b. Organic content or topsoil shall be not less than 1.5 percent by weight.
c. Topsoil having soluble salt content greater than 500 parts per million shall not be used.
d. No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.

Note: Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.

ii. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization – Section I – Vegetative Stabilization Methods and Materials.

V. Topsoil Application

i. When topsoiling, maintain needed erosion and sediment control practices such as diversions, grade stabilization structures, earth dikes, slope silt fence and sediment traps and basins.

ii. Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4" – 8" higher in elevation.

iii. Topsoil shall be uniformly distributed in a 4" – 8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.

iv. Topsoil shall not be placed while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

VI. Alternative for Permanent Seeding – Instead of applying the full amounts of lime and commercial fertilizer, composted sludge and amendments may be applied as specified below:

i. Composted Sludge Material for use as a soil conditioner for sites having distributed areas over 5 acres shall be tested to prescribe amendments and for sites having disturbed areas under 5 acres shall conform to the following requirements:

a. Composted sludge shall be supplied by, or originate from, a person or persons that are permitted (at the time of acquisition of the compost) by the Maryland Department of the Environment under COMAR 26.04.06.
b. Composted sludge shall contain at least 1 percent nitrogen, 1.5 percent phosphorus, and 0.2 percent potassium and have a pH of 7.0 to 8.0. If compost does not meet these requirements, the appropriate constituents must be added to meet the requirements prior to use.
c. Composted sludge shall be applied at a rate of 1 ton/1,000 square feet.

iv. Composted sludge shall be amended with a potassium fertilizer applied at the rate of 4 lb/1,000 square feet, and 1/3 the normal lime application rate.

References: Guidelines Specifications, Soil Preparation and Sodding. MD-VA, Pub. #1, Cooperative Extension Service, University of Maryland and Virginia Polytechnic Institutes, Revised 1973.

30.0 DUST CONTROL

Definition

Controlling dust blowing and movement on construction sites and roads.

Purpose

To prevent blowing and movement of dust from exposed soil surfaces, reduce on and off-site damage, health hazards, and improve traffic safety.

Conditions Where Practice Applies

This practice is applicable to areas subject to dust blowing and movement where on and off-site damage is likely without treatment.

Specifications

Temporary Methods

1. Mulches – See standards for vegetative stabilization with mulches only. Mulch should be crimped or tracked to prevent blowing.
2. Vegetative Cover – See standards for temporary vegetative cover.
3. Tillage – To roughen surface and bring clods to the surface. This is an emergency measure which should be used before soil blowing starts. Begin plowing on windward side of site. Chisel-type plows spaced about 12" apart, spring-toothed harrows, and similiar plows are examples of equipment which may produce the desired effect.
4. Irrigation – This is generally done as an emergency treatment. Site is sprinkled with water until the surface is moist. Repeat as needed. At no time should the site be irrigated to the point that runoff begins to flow.
5. Barriers – Solid board fences, silt fences, snow fences, burlap fences, straw bales, and similiar material can be used to control air currents and soil blowing. Barriers placed at right angles to prevailing currents at intervals of about 10 times their height are effective in controlling soil blowing.
6. Calcium Chloride – Apply at rates that will keep surface moist. May need retreatment.

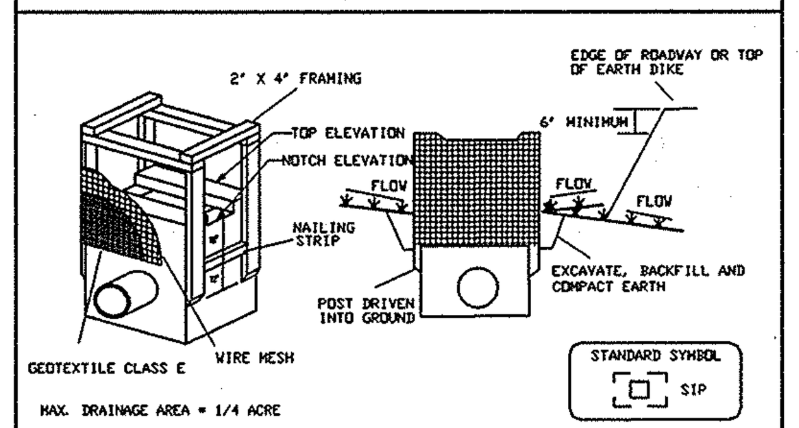
Permanent Methods

1. Permanent Vegetation – See standards for permanent vegetative cover, and permanent stabilization with sod. Existing trees or large shrubs may afford valuable protection if left in place.
2. Topsoiling – Covering with less erosive soil materials. See standards for topsoiling.
3. Stone – Cover surface with crushed stone or coarse gravel.

References

1. Agriculture Handbook 346. Wind Erosion Forces in the United States and Their Use in Predicting Soil Loss.
2. Agriculture Information Bulletin 354. How to Control Wind Erosion, USDA-ARS.

DETAIL 23A - STANDARD INLET PROTECTION



MAX. DRAINAGE AREA = 1/4 ACRE

Construction Specifications

1. Excavate completely around the inlet to a depth of 18" below the notch elevation.
2. Drive the 2" x 4" construction grade lumber posts 1' into the ground at each corner of the inlet. Place nail strips between the posts on the ends of the inlet. Assemble the top portion of the 2" x 4" frame using the overlap joint shown on Detail 23A. The top of the frame (weir) must be 6" below adjacent roadways where flooding and safety issues may arise.
3. Stretch the 1/2" x 1/2" wire mesh tightly around the frame and fasten securely. The ends must meet and overlap at a post.
4. Stretch the Geotextile Class E tightly over the wire mesh with the geotextile extending from the top of the frame to 18" below the inlet notch elevation. Fasten the geotextile firmly to the frame. The ends of the geotextile must meet at a post, be overlapped and folded, then fastened down.
5. Backfill around the inlet in compacted 6" layers until the layer of earth is level with the notch elevation on the ends and top elevation on the sides.
6. If the inlet is not in a sump, construct a compacted earth dike across the ditch line directly below it. The top of the earth dike should be at least 6" higher than the top of the frame.
7. The structure must be inspected periodically and after each rain and the geotextile replaced when it becomes clogged.

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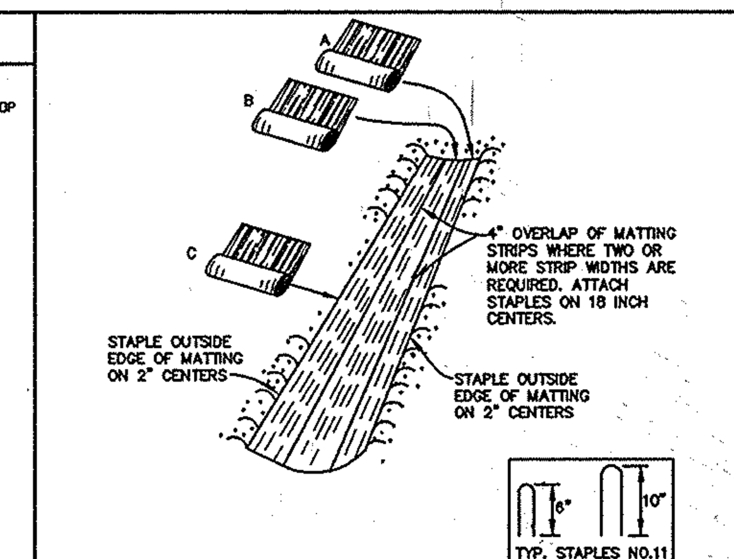


CONSTRUCTION SPECIFICATIONS

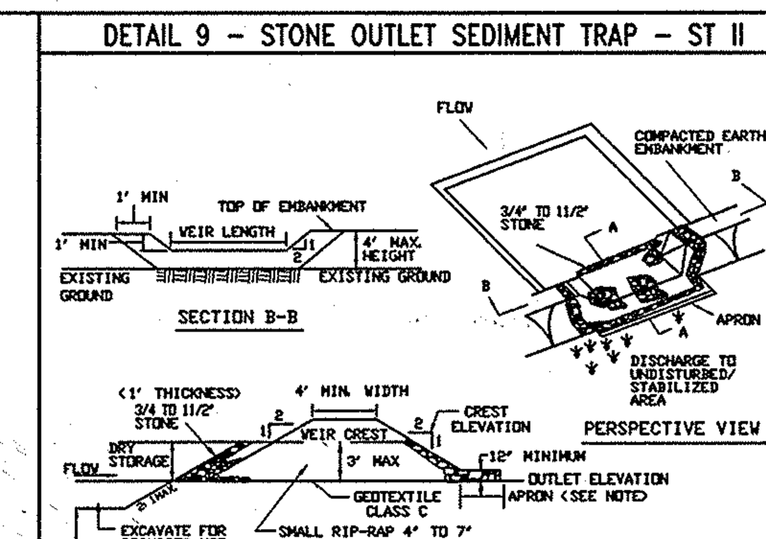
1. KEY-IN THE MATTING BY PLACING THE TOP ENDS OF THE MATTING IN A NARROW TRENCH, 6" IN DEPTH. BACKFILL THE TRENCH AND TAMP FIRMLY TO CONFORM TO THE CHANNEL CROSS-SECTION. SECURE WITH A ROW OF STAPLES ABOUT 4" DOWN SLOPE FROM THE TRENCH. SPACING BETWEEN STAPLES IS 6".
2. STAPLE THE 4" OVERLAP IN THE CHANNEL CENTER USING AN 18" SPACING BETWEEN STAPLES.
3. BEFORE STAPLING THE OUTER EDGES OF THE MATTING, MAKE SURE THE MATTING IS SMOOTH AND IN FIRM CONTACT WITH THE SOIL.
4. STAPLES SHALL BE PLACED 2' APART WITH 4 ROWS FOR EACH STRIP, 2 OUTER ROWS, AND 2 ALTERNATING ROWS DOWN THE CENTER.
5. WHERE ONE ROLL OF MATTING ENDS AND ANOTHER BEGINS, THE END OF THE TOP STRIP SHALL OVERLAP THE UPPER END OF THE LOWER STRIP BY 4", SHIPLAP FASHION. REINFORCE THE OVERLAP WITH A DOUBLE ROW OF STAPLES SPACED 6" APART IN A STAGGERED PATTERN ON EITHER SIDE.
6. THE DISCHARGE END OF THE MATTING LINER SHOULD BE SIMILARLY SECURED WITH 2 DOUBLE ROWS OF STAPLES.

NOTE: IF FLOW WILL ENTER FROM THE EDGE OF THE MATTING THEN THE AREA EFFECTED BY THE FLOW MUST BE KEYED-IN.

SOIL STABILIZATION MATTING – (ECM)

NOT TO SCALE

DETAIL 9 – STONE OUTLET SEDIMENT TRAP – ST II



Construction Specifications

1. Area under embankment shall be cleared, grubbed and stripped of any vegetation and root mat. The pool area shall be cleared.
2. The fill material for the embankment shall be free of roots and other woody vegetation as well as over-sized stones, rocks, organic material or other objectionable material. The embankment shall be compacted by traversing with equipment while it is being constructed.
3. All cut and fill slopes shall be 2:1 or flatter.
4. The stone used in the outlet shall be small rip-rap 4" to 7" in size with a 1' thick layer of 3/4" to 11/2" washed aggregate placed on the upstream face of the outlet. Stone facing shall be as necessary to prevent clogging. Geotextile Class C may be substituted for the stone facing by placing it on the inside face of the stone outlet.
5. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to one half of the wet storage depth of the trap. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.

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STONE OUTLET SEDIMENT TRAP – ST II

6. The strcture shall be inspected periodically and after each rain and repairs made as needed.
7. Construction of traps shall be carried out in such a manner that sediment pollution is abated. Once constructed, the top and outside face of the embankment shall be stabilized with seed and mulch. Points of concentration inflow shall be protected in accordance with Grade Stabilization Structure criteria. The remainder of the interior slopes should be stabilized (one time) with seed and mulch upon trap completion and monitored and maintained erosion free during the life of the trap.
8. The structure shall be dewatered by approved methods, removed and the area stabilized when the drainage area has been properly stabilized.
9. Refer to Section D for specifications concerning trap dewatering.
10. Minimum trap depth shall be measured from the weir elevation.
11. The elevation of the top of any dike directing water into the trap must equal or exceed the elevation of the trap embankment.
12. Geotextile Class C shall be placed over the bottom and sides of the outlet channel prior to the placement of stone. Sections of filter cloth must overlap at least 1' with the section nearest the entrance placed on top. The filter cloth shall be embedded at least 6" into existing ground at the entrance of the outlet channel.
13. Outlet – An outlet shall be provided, including a means of conveying the discharge in an erosion free manner to an existing stable channel.

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No As-Built information is required on this sheet.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-14

ENGINEER'S CERTIFICATE

"I HEREBY CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

ENGINEER — DATE 10-27-10

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

DEVELOPER — DATE 10-27-10

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SCD — DATE 6/3/10

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 11-9-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 12/06/10

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 12/3/10

SEQUENCE OF CONSTRUCTION

NOTIFY SEDIMENT CONTROL DIVISION 48 HOURS PRIOR TO START OF CONSTRUCTION

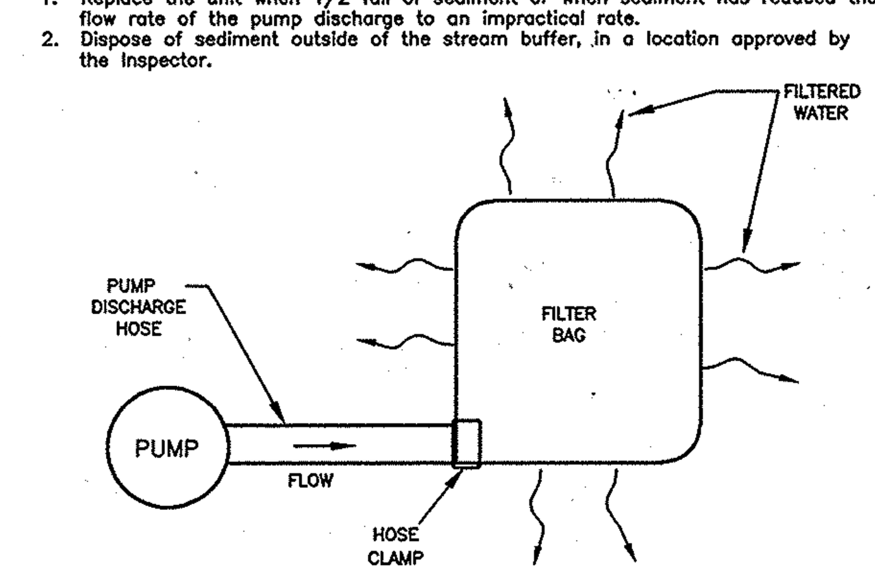
1. OBTAIN GRADING PERMIT. IN STREAM WORK IS COVERED BY MDE PERMIT 200667614. NO INSTREAM CONSTRUCTION SHALL BE PERFORMED BETWEEN MARCH1 AND JUNE 15. (DAY 5)
2. INSTALL STABILIZED CONSTRUCTION ENTRANCE, AND PERIMETER SILT FENCE AND SUPER SILT FENCE. (DAY 6-17)
3. PER THE MDE PERMIT AND THE CONSTRUCTION PLANS, REMOVE EXISTING HEADWALLS AND INSTALL 48" CULVERT PIPE EXTENSIONS AND RECONSTRUCT HEADWALLS. DURING CONSTRUCTION, FOR DAILY PUMP-AROUND REMOVAL, STABILIZE STREAM BANK AND BOTTOM WITH RIPRAP, PER MWCG DETAIL 2.1 AND CULVERT EXTENSION SPECIFICATIONS, SHEET 6. (DAY 18-25)
4. INSTALL SEDIMENT TRAPS AND EARTH DIKES. CLEAR AND GRUB SITE, ENSURING SEDIMENT CONTROL MEASURES ARE MAINTAINED. AREAS OUTSIDE OF TRAP CONTROL SHOULD BE TEMPORARILY STABILIZED IMMEDIATELY UPON COMPLETION OF CLEARING. (DAY 26-33)
5. BRING SITE TO MASS GRADES, MAINTAINING DRAINAGE TOWARD TRAPS. AREAS OUTSIDE OF TRAP CONTROL SHOULD BE TEMPORARILY STABILIZED IMEDIATELY UPON REACHING FINAL GRADES. AREAS OF SLOPES GREATER THAN OR EQUAL TO 3:1 SHOULD BE STABILIZED IMMEDIATELY UPON COMPLETION.(DAY 34-45)
6. INSTALL STORM DRAINS INLET I-1 THROUGH E-1 AND I-3 THROUGH M-2. INSTALL INLET PROTECTION. BEGIN ROUGH GRADING KINDLER OVERLOOK DRIVE. MAINTAIN DRIVEWAY ACCESS THROUGH THE SITE FOR ADJACENT PROPERTIES. (DAY 46-55)
7. PROVIDE TEMPORARY SEDIMENT CONTROL IN ROADSIDE SWALES UTILIZING SUPER SILT FENCE PERPENDICULAR TO THE DIRECTION OF FLOW AS NECESSARY. STABILIZE SWALES IMMEDIATELY UPON COMPLETION OF GRADING.
8. UPON COMPLETION OF MASS GRADING, AND WITH APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR (INSPECTOR), REMOVE EARTH DIKES AND TRAPS, BRING TRAP AREAS TO GRADE AND STABILIZE. (DAY 46-52)
9. INSTALL WATER, SEWER AND STORM DRAINS. PROVIDE INLET PROTECTION FOR ALL INLETS, AS THEY ARE CONSTRUCTED. (DAY 53-98)
10. UPON APPROVAL OF THE INSPECTOR, BRING ROAD BEDS TO SUBGRADE AND STABILIZE SLOPES IN ACCORDANCE WITH TEMPORARY SEEDBED NOTES. UTILIZE DUST CONTROL METHODS. (DAY 99-110)
11. CONSTRUCT CURB AND GUTTER AND PAVE ROADWAYS. (DAY 110-111)
12. AFTER DRAINAGE AREAS ARE COMPLETELY STABILIZED, INSTALL UNDERDRAINS, PLANTING SOILS AND PLANT MATERIALS IN THE BIOSWALE BEHIND LOTS 1-7. (DAY 112-114)
13. UPON APPROVAL OF INSPECTOR, REMOVE REMAINING SEDIMENT CONTROL DEVICES AND STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT SEEDBED NOTES. (DAY 115-119)

FILTER BAG

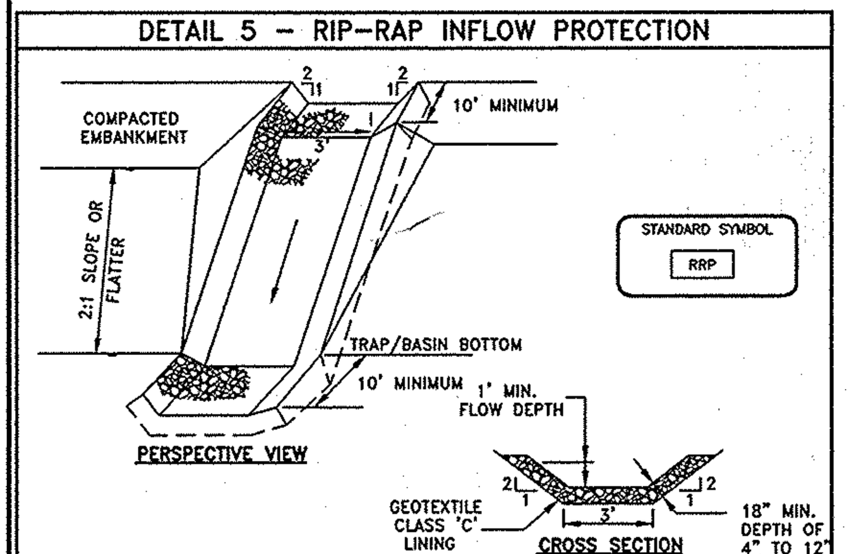
Specification:
1. Filter Bag shall be constructed of filter fabric with a maximum apparent opening size cooresponding with US Sieve Size 40 (0.425mm).

Installation:
1. Unfold Filter Bag on a stabilized area over dense vegetation, straw, or gravel (if an increased drainage surface is needed).
2. Insert discharge hose from pump into Filter Bag a minimum of six inches (6") and tightly clamp to prevent water from flowing out of the unit without being filtered.

Maintenance:
1. Replace the unit when 1/2 full of sediment or when sediment has reduced the flow rate of the pump discharge to an impractical rate.
2. Dispose of sediment outside of the stream buffer, in a location approved by the inspector.



DETAIL 5 – RIP-RAP INFLOW PROTECTION



CONSTRUCTION SPECIFICATIONS

1. All lined inflow channels shall be 1' in depth, have a trapezoidal cross section with 2:1 or flatter side slopes and 3' (min.) bottom width. The channel shall be lined with 4" to 12" rip-rap to a depth of 18".
2. Filter cloth shall be installed under all rip-rap. Filter cloth shall be Geotextile Class C.
3. Entrance and exit sections shall be installed as shown on the detail section.
4. Rip-Rap used for the lining may be recycled for permanent outlet protection if the basin is to be converted to a stormwater management facility.
5. Gabion Inflow Protection may be used in lieu of Rip-Rap Inflow Protection.
6. Rip-Rap should blend into existing ground.
7. Rip-Rap Inflow Protection shall be used where the slope is between 4:1 and 10:1, for slopes flatter than 10:1 use Earth Dike or Temporary Swale lining criteria.

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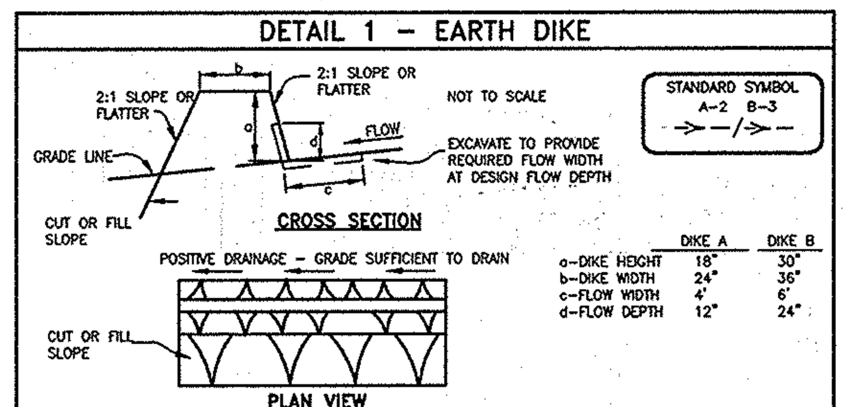
DETAIL 1 – EARTH DIKE



	DIKE A	DIKE B
a-DIKE HEIGHT	18"	30"
b-DIKE WIDTH	24"	36"
c-FLOW WIDTH	4'	6'
d-FLOW DEPTH	12"	24"

FLOW CHANNEL STABILIZATION
GRADE 0.5% MIN. 10% MAX.

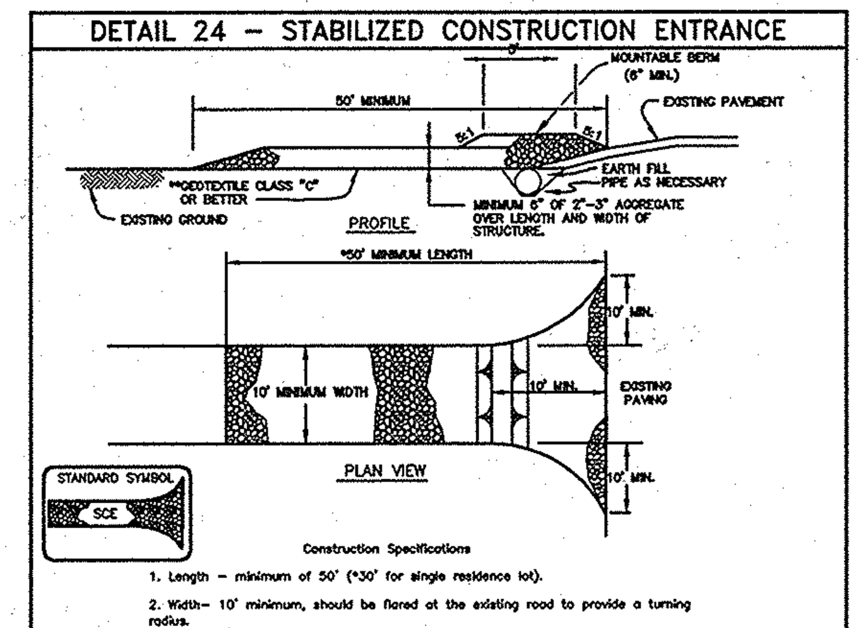
1. Seed and cover with straw mulch.
2. Seed and cover with Erosion Control Matting or line with sod.
3. 4" – 7" stone or recycled concrete equivalent pressed into the soil 7" minimum.

CONSTRUCTION SPECIFICATIONS

1. All temporary earth dikes shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.
2. Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.
3. Runoff diverted from an undisturbed area shall outlet directly into an undisturbed, stabilized area at a non-erosive velocity.
4. All trees, brush, stumps, obstructions, and other objectional material shall be removed and disposed of so as not to interfere with the proper functioning of the dike.
5. The dike shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.
6. Fill shall be compacted by earth moving equipment.
7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the dike.
8. Inspection and maintenance must be provided periodically and after each rain event.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE A - 1 - 6	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 24 – STABILIZED CONSTRUCTION ENTRANCE

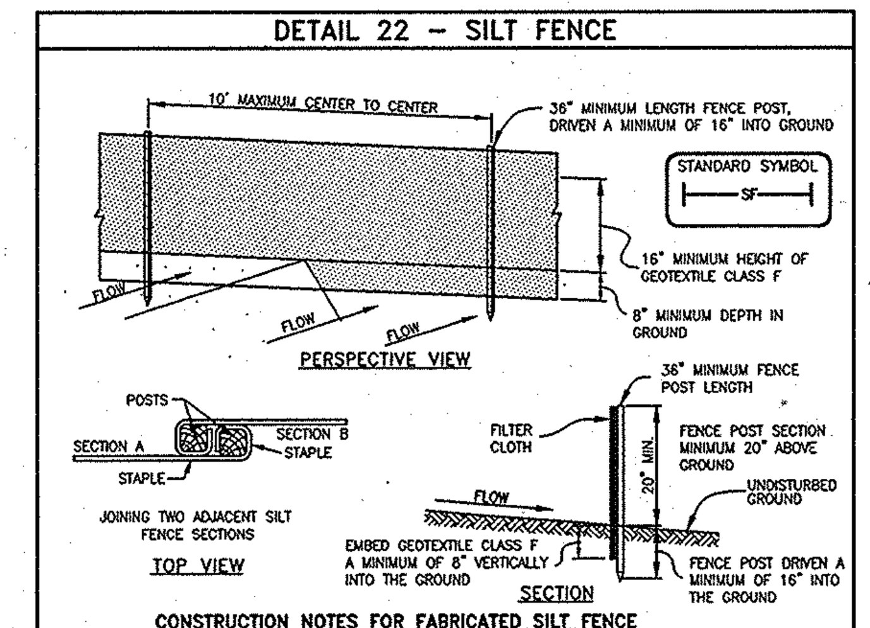


Construction Specifications

1. Length – minimum of 50' (*30' for single residence lot).
2. Width– 10' minimum, should be flared at the existing road to provide a turning radius.
3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. **The plan approval authority may not require single family residence to use geotextile.
4. Stone – crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.
5. Surface Water – all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mounted berg with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.
6. Location – A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 17 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 22 – SILT FENCE



CONSTRUCTION NOTES FOR FABRICATED SILT FENCE

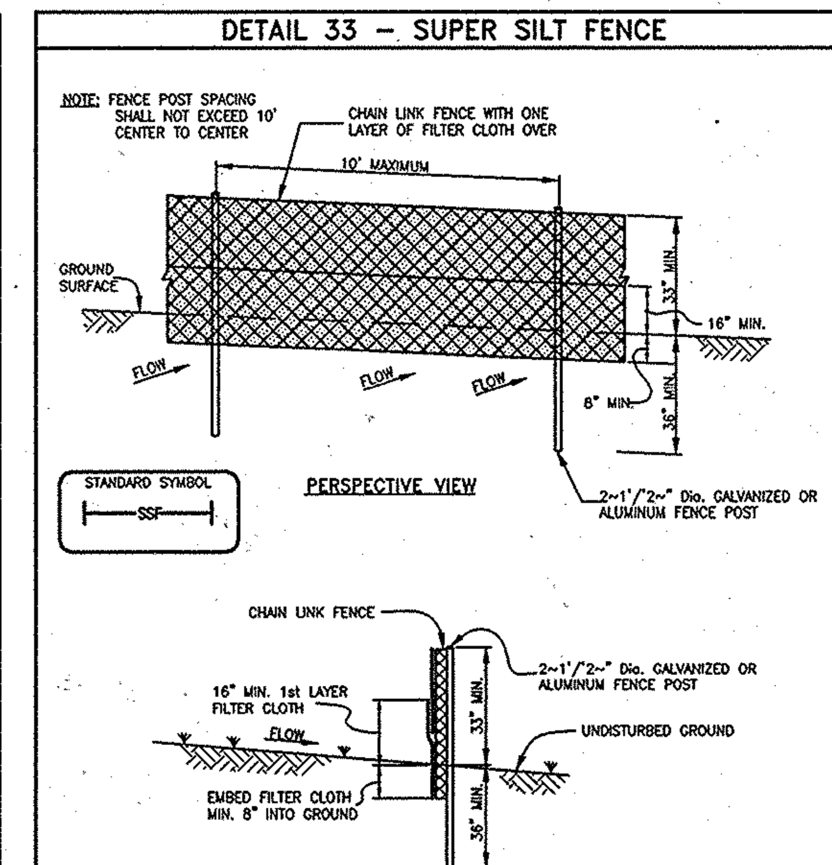
1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 11/2" x 11/2" square (minimum) cut, or 13/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighing not less than 1.00 pond per linear foot.
2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal ft / minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.
4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 50% of the fabric height.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E - 15 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 33 – SUPER SILT FENCE



U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE H - 26 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

SUPER SILT FENCE

CONSTRUCTION SPECIFICATIONS

1. Fencing shall be 42" in height and constructed in accordance with the latest Maryland State Highway Details for Chain Link Fencing. The specification for a 6' fence shall be used, substituting 42" fabric and 6' length posts.
2. Chain link fence shall be fastened securely to the fence posts with wire ties. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the ends of the fence.
3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.
4. Filter cloth shall be embedded a minimum of 8" into the ground.
5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded.
6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height
7. Filter cloth shall be fastened securely to each fence post with wire ties or staples at top and mid section and shall meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal/ft /minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

SUPER SILT FENCE DESIGN CRITERIA

Slope	Slope Steepness	Slope Length (maximum)	Silt Fence Length (maximum)
0 – 10%	0 – 10:1	Unlimited	Unlimited
10 – 20%	10:1 – 5:1	200 feet	1,500 feet
20 – 33%	5:1 – 3:1	100 feet	1,000 feet
33 – 50%	3:1 – 2:1	100 feet	500 feet
50% +	2:1 +	50 feet	250 feet

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E - 26 - 3A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

NO.	DATE	REVISION
1	AUG 2010	REDESIGN TO INCORPORATE SWM ESD METHODS, REVISED BY SHEET SUBSTITUTION.

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
60 THOMAS JOHNSON DRIVE ▲ FREDERICK, MARYLAND 21702
(P) 301-371-3505 (F) 301-371-3506
WWW.BEI-CIVILENGINEERING.COM

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22390 Expiration Date: 6-30-11

OWNER/DEVELOPER:
HB DEVELOPMENT, INC.
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20723
410-792-2565

PROJECT: KINDLER OVERLOOK
LOTS 1-19 AND OPEN SPACE 20
REVISED FINAL ROAD CONSTRUCTION PLAN

LOCATION: TAX MAP: 41 PARCEL 385, 395, P/O 401
GRID: 18 ZONED: R-20
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

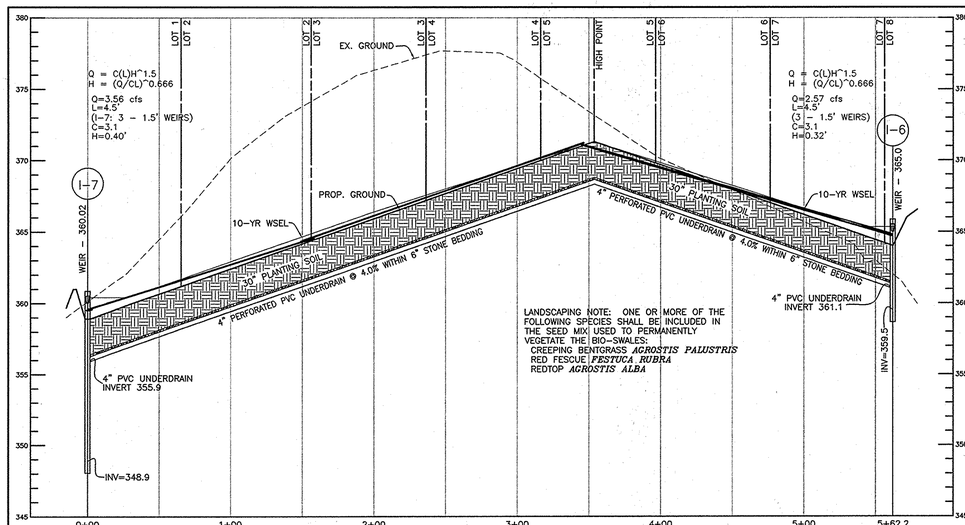
TITLE: SEDIMENT AND EROSION CONTROL NOTES AND DETAILS

DATE: ~~JUL 2006~~ AUGUST — PROJECT NO. 1328

DESIGN: AAM — DRAFT: MAN — CHECK: CAM — SCALE: AS SHOWN — SHEET 7 OF 13

AS-BUILT

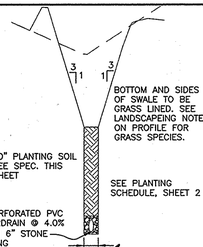
F-07-003



BIORETENTION SWALE PROFILE
LOTS 1 THROUGH 7

SCALE: 1" = 50'

LANDSCAPING NOTE: ONE OR MORE OF THE FOLLOWING SPECIES SHALL BE INCLUDED IN THE SEED MIX USED TO PERMANENTLY VEGETATE THE BIO-SWALES:
CREEPING BENTGRASS *AGROSTIS PALUSTRIS*
RED FESCUE *FESTUCA RUBRA*
REDTOP *AGROSTIS ALBA*



BIO-SWALE CROSS SECTION

NOT TO SCALE

LOT BY LOT ONSITE STORMWATER MANAGEMENT METHODS

	METHOD	MAINTENANCE		METHOD	MAINTENANCE
LOT 1	ROOFTOP DISCONNECT BIO-SWALE	OWNER JOINT-OWNER-HOA	LOT 10	ROOFTOP DISCONNECT MICRO-BIORETENTION	OWNER OWNER
LOT 2	ROOFTOP DISCONNECT BIO-SWALE	OWNER JOINT-OWNER-HOA	LOT 11	ROOFTOP DISCONNECT INFILTRATION BERM	OWNER OWNER
LOT 3	ROOFTOP DISCONNECT BIO-SWALE	OWNER JOINT-OWNER-HOA	LOT 12	ROOFTOP DISCONNECT INFILTRATION BERM	OWNER OWNER
LOT 4	ROOFTOP DISCONNECT BIO-SWALE	OWNER JOINT-OWNER-HOA	LOT 13	ROOFTOP DISCONNECT INFILTRATION BERM	OWNER OWNER
LOT 5	ROOFTOP DISCONNECT BIO-SWALE	OWNER JOINT-OWNER-HOA	LOT 14	ROOFTOP DISCONNECT INFILTRATION BERM	OWNER OWNER
LOT 6	ROOFTOP DISCONNECT BIO-SWALE	OWNER JOINT-OWNER-HOA	LOT 15	ROOFTOP DISCONNECT INFILTRATION BERM	OWNER OWNER
LOT 7	ROOFTOP DISCONNECT BIO-SWALE	OWNER JOINT-OWNER-HOA	LOT 16	ROOFTOP DISCONNECT INFILTRATION BERM	OWNER OWNER
LOT 8	ROOFTOP DISCONNECT MICRO-BIORETENTION	OWNER OWNER	LOT 17	ROOFTOP DISCONNECT INFILTRATION BERM	OWNER OWNER
LOT 9	ROOFTOP DISCONNECT MICRO-BIORETENTION	OWNER OWNER	LOT 18	MICRO-BIORETENTION	OWNER

OPERATION AND MAINTENANCE SCHEDULE FOR BIO-SWALES

HOMEOWNER MAINTENENCE:

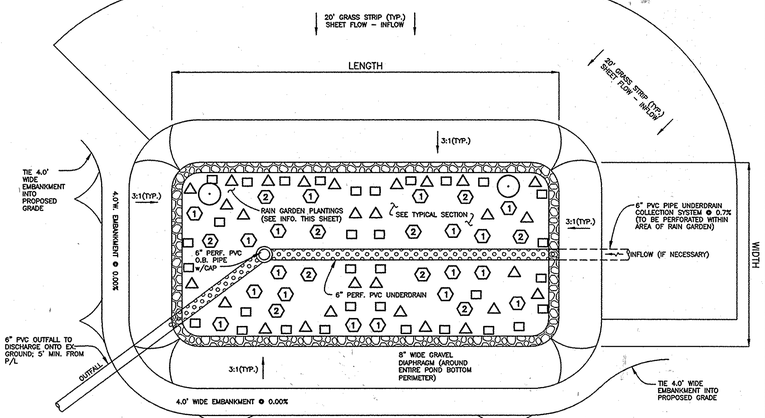
1. GRASS AREAS SHALL BE MOWED A MINIMUM OF TWICE ANNUALLY, TO REDUCE COMPTITION FROM WEEDS.
2. IRRIGATION MAY BE NEEDED DURING DRY WEATHER TO ESTABLISH VEGITATION.
3. SPARCELY VEGETATED AREAS SHALL BE RESEEDED TO MAINTAIN DENSE COVEDRAGE.
4. IF WATER DOES NOT DRAIN WITHIN 48 HOURS, THE BOTTOM SOIL SHOULD BE TILLED AND REVEGETATED.
5. INSPECTIONS SHOULD BE PERFORMED ONCE A YEAR TO ASSESS SLOPE INTEGRITY, VEGETATIVE HEALTH, SOIL STABILITY, COMPACTION, EROSION, PONDING AND SEDIMENTATION. PERIODIC REMOVAL OF SEDIMENT, LITTER, OR OBSTRUCTIONS SHOULD BE DONE AS NEEDED. ERODED SIDE SLOPES AND THE SWALE BOTTOM SHOULD BE REPAIRED AND STABILIZED AS NEEDED.
6. DEAD OR DYING TREES OR SHRUBS SHALL BE REPLACED WITH SIMILAR MATERIALS.
7. CHECK DAMS (IF PROVIDED) ARE THE RESPONSIBILITY OF THE INDIVIDUAL HOMEOWNER.

HOMEOWNER ASSOCIATION MAINTENENCE:

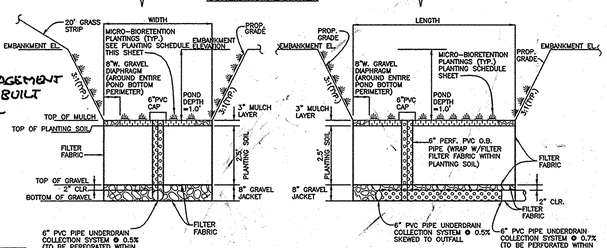
1. IN THE EVENT THAT UNDERDRAINS MUST BE EXCAVATED AND REPLACED, THIS SHALL BE THE RESPONSIBILITY OF THE HOMEOWNERS ASSOCIATION.

BIO-SWALE CONSTRUCTION SPECIFICATIONS

1. SWALES SHALL NOT BE CONVERTED TO BIO-SWALES UNTIL THE SURROUNDING SITE IS STABILIZED.
2. IT IS IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF THE BIORETENTION AREA AND THE PLANTING SOILS.
3. ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE PLACEMENT OF UNDERDRAIN.
4. WHEN BACKFILLING THE PLANTIONG SOILS, PLACE SOIL IN LIFTS OF 12" TO 18". DO NOT USE HEAVY EQUIPEMENT WITHIN THE BIORETENTION AREA.
5. SIDESLOPES WITHIN THE BIO-SWALE SHALL BE A MAXIMUM OF 3:1 SLOPES.
6. ALL CHANGES IN GRADING SHALL BE SMOOTHED AND ROUNDED, TO ENSURE EASE OF FUTURE MOWING.



SCHEMATIC PLAN VIEW



TYPICAL PROFILE

MICRO-BIORETENTION TYPICAL DETAIL

NOT TO SCALE

TYPICAL SECTION

MICRO-BIORETENTION GEOMETRY TABLE

	LOT 8	LOT 9	LOT 10	LOT 18
FILTER WIDTH	5'	5'	4'	5'
FILTER LENGTH	38'	47'	50'	57'
FILTER SURFACE (SF)	109	139	208	173
EMBANKMENT EL. (FT)	351.2	369.2	369.9	364.0
TOP OF MULCH EL. (FT)	350.2	368.2	368.9	363.0
TOP OF PLANTING SOIL EL. (FT)	350.0	368.0	368.7	362.8
TOP OF GRAVEL EL. (FT)	357.5	365.5	366.2	360.3
BOTTOM OF GRAVEL EL. (FT)	356.8	364.8	365.5	359.6

OPERATION & MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION

1. ANNUAL MAINTENANCE OF PLANT MATERIAL AND MULCH LAYER IS REQUIRED. MAINTENANCE OF MULCH IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH-OUT. ANY REPLACEMENT OF MULCH SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE & INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL & PRUNING.
2. SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN THE SPRING AND FALL. THIS INSPECTION WILL INCLUDE; REMOVAL OF DEAD & DISEASED VEGETATION CONSIDERED BEYOND TREATMENT; TREATMENT OF ALL DISEASED TREES & SHRUBS; AND REPLACEMENT OF ALL DEFICIENT STAKES & WIRES.
3. MULCH SHALL BE INSPECTED EACH SPRING. REMOVE THE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.
4. SOIL EROSION TO BE ADDRESSED ON AN AS-NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.

MICRO-BIORETENTION LOT 8 PLANTING SCHEDULE

1	Lobelia cardinalis	5
△	Iris versicolor	6
□	Andropogon virginicus	5
2	Rudbeckinea laciniata	5
·	Acer Rubrum	1

MICRO-BIORETENTION LOT 9 PLANTING SCHEDULE

1	Lobelia cardinalis	7
△	Iris versicolor	7
□	Andropogon virginicus	6
2	Rudbeckinea laciniata	7
·	Acer Rubrum	1

MICRO-BIORETENTION LOT 10 PLANTING SCHEDULE

1	Lobelia cardinalis	14
△	Iris versicolor	9
□	Andropogon virginicus	9
2	Rudbeckinea laciniata	8
·	Acer Rubrum	1

MICRO-BIORETENTION LOT 18 PLANTING SCHEDULE

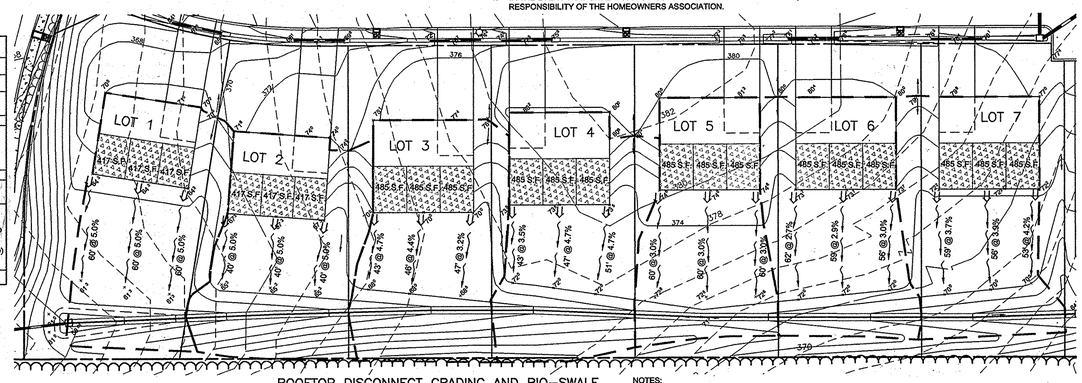
1	Lobelia cardinalis	8
△	Iris versicolor	9
□	Andropogon virginicus	9
2	Rudbeckinea laciniata	7
·	Acer Rubrum	1

MICRO-BIORETENTION – PLANTING DATA

1. PLANTINGS WITHIN THE PONDING AREA OF THE MICRO-BIORETENTION ARE TO BE OF A MEDIUM TO HIGH WATER TOLERANCE SUGGESTED SPECIES:
   CREEPING BUGLEWEED (AJUGA REPTANS)
   COMMON PERIWINKLE (VINCA MINOR)
   LILY-TURF (LIRIOPE, SP.)
2. PLANTINGS ALONG THE PERIMETER (BERM) AREA OF THE FACILITY ARE TO BE OF A LOW TO MEDIUM WATER TOLERANCE SUGGESTED SPECIES:(PERENNIALS/ANNUALS)
   IRIS (IRIS VERSICOLOR)
   DAYLILY (HEMEROCALLIS SP.)
   WHITE GLORY (ASTIBLE SP.)
3. AVOID PLANTINGS WITH EXCESSIVE ROOT MASS IN POND AREA OF THE FACILITY NEAR PIPE AND UNDERDRAIN.
4. SEE SHEET 2 FOR TREE PLANTING DETAIL.

TABLE B.3.2 MATERIALS AND SPECIFICATIONS FOR SWM FACILITIES

MATERIAL	SPECIFICATION	SIZE	NOTES:
PLANTINGS (IF REQUIRED)	SEE APPENDIX A: TABLE A.4	N/A	PLANTINGS ARE SITE SPECIFIC
PLANTING SOIL (2.5' TO 4.0' DEEP)	SAND: 35-60% SILT: 30-35% CLAY: 10-25%	N/A	USDA SOIL TYPES: LOAMY SAND, SANDY LOAM OR LOAM
MULCH	SHREDDED HARDWOOD	N/A	2" TO 3" DEPTH, AGED 6 MONTHS, MINIMUM
GEOTEXTILE (CLASS "C")	APPARENT OPENING SIZE: (ASTM D-4751) GRAB TENSILE STRENGTH: (ASTM D-4632) PUNCTURE RESISTANCE: (ASTM D-4833)	N/A	FOR USE AS NECESSARY BENEATH UNDERDRAINS ONLY
UNDERDRAIN GRAVEL	AASHTO M-43	0.375" TO 0.750"	
UNDERDRAIN PIPING	F758, TYPE PS28 OR AASHTO M-278	4" TO 6" RIGID SCH.40 PVC OR SDR35	3/8" PERF. @ 6" O/C, 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES, NOT NECESSARY UNDERNEATH PIPES
POURED-IN-PLACE CONC. (IF REQUIRED)	MSHA MIX NO.3; f'c=3500psi @ 28 DAYS, NORMAL WEIGHT, AIR ENTRAINED; REINFORCING TO MEET ASTM 615-60	N/A	ON-SITE TESTING OF POURED-IN-PLACE CONC. REQUIRED; 28 DAY STRENGTH TEST AND SLUMP TEST; ALL CONC. DESIGN (CAST -IN-PLACE or PRE-CAST) NOT USING PREVIOUSLY APPROVED STATE OR LOCAL STANDARDS REQUIRES DESIGN DRAWINGS SEALED AND APPROVED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF MARYLAND. - DESIGN TO INCLUDE MEETING ACI CODE 350.6/9b: VERTICAL LOADING (M-10 or H-20) ALLOWABLE HORIZONTAL LOADING (BASED ON SOIL PRESSURES); AND ANALYSIS OF POTENTIAL CRACKING
CHECK DAM (TREATED WOOD)	AWPA STANDARD C6	6"X6" OR 8"X8"	DO NOT COAT WITH CREOSOTE. EMBED AT LEAST 3' INTO SIDE SLOPES



ROOFTOP DISCONNECT GRADING AND BIO-SWALE
LOTS 1 THROUGH 7

SCALE: 1" = 40'

NOTES:
1. PIPE FRONT DOWNSPOUTS TO DAYLIGHT IN HIGH END OF BIO-SWALE.
2. GRADE BACK YARDS TO SHEET FLOW PER SPOT SHOTS AND FLOW ARROWS.
3. SEE SHEET 2 FOR LANDSCAPING PLAN.

LEGEND

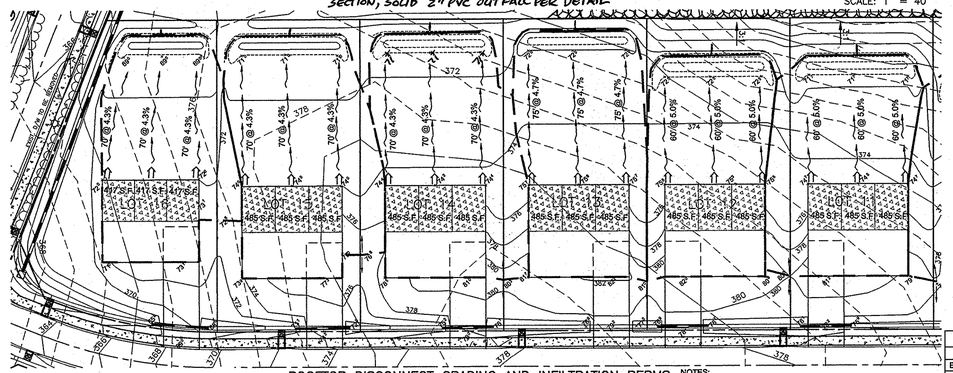
SOILS CLASSIFICATION	GcB2(B)
SOILS DELINEATION	
EXISTING CONTOURS	700
PROPOSED CONTOURS	700
EXISTING WOODS LINE	
PROPOSED WOODS LINE	
EXISTING STRUCTURE	
PROPOSED HOUSE	
ROOFTOP DISCONNECT AREA	

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 9-19-14

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-14

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER

*ON LOT STORMWATER MANAGEMENT FACILITIES ARE TO BE AS-BUILT AS PART OF THE INDIVIDUAL GRADE CERTIFICATION FOR EACH LOT.



ROOFTOP DISCONNECT GRADING AND INFILTRATION BERMS
LOTS 11 THROUGH 16

SCALE: 1" = 40'

NOTES:
1. PIPE FRONT DOWNSPOUTS TO DAYLIGHT IN INFILTRATION BERM.
2. GRADE BACK YARDS TO SHEET FLOW PER SPOT SHOTS AND FLOW ARROWS.

INFILTRATION BERM CONSTRUCTION SPECIFICATIONS

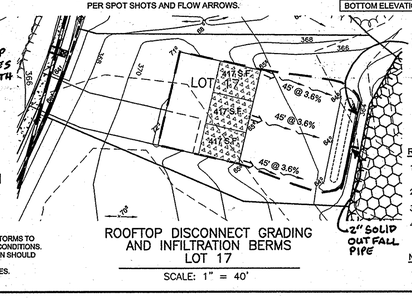
1. FINAL GRADING FOR INFILTRATION BERMS SHALL NOT TAKE PLACE UNTIL THE SURROUNDING SITE IS STABILIZED.
2. SOILS WITHIN THE STORAGE AREAS SHALL NOT BE COMPACTED.
3. BERMS SHALL BE CONSTRUCTED WITH A GRAVEL CORE COMPRISED OF AASHTO M-43, EXTENDING TO A DEPTH EQUAL TO THE BOTTOM ELEVATION OF THE STORAGE AREA. THE SIDES AND TOPS OF THE BERMS SHALL BE COVERED WITH A 6" LAYER OF TOPSOIL, AND PERMANENTLY STABILIZED WITH GRASS, AS PER SHEET 3.
4. TOPS OF BERMS SHALL BE LEVEL, AT THE PRESCRIBED ELEVATIONS, AND THE CREST SHALL BE A MINIMUM OF 2' WIDE.
5. SIDES OF THE BERM SHALL BE A MAXIMUM OF 3:1 SLOPES.
6. ALL CHANGES IN GRADING SHALL BE SMOOTHED AND ROUNDED, TO ENSURE EASE OF FUTURE MOWING.

INFILTRATION CROSS SECTION

NOT TO SCALE

OPERATION AND MAINTENANCE SCHEDULE FOR HOMEOWNER MAINTAINED INFILTRATION BERMS

FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS TO ENSURE THAT PONDING WATER DOES NOT CREATE NUISANCE CONDITIONS. SIGNS OF CONCENTRATED FLOW AND OTHER SURFACE EROSION SHOULD BE REPAIRED TO PROMOTE SHEETFLOW.
A DENSE MAT OF VEGETATION SHOULD BE PRESENT AT ALL TIMES.
VEGETATION SHOULD BE REPLACED AS NEEDED.



ROOFTOP DISCONNECT GRADING AND INFILTRATION BERMS
LOT 17

SCALE: 1" = 40'

OPERATION AND MAINTENANCE SCHEDULE FOR JOINTLY MAINTAINED ROADSIDE SWALES

ROUTINE MAINTENANCE TO BE PERFORMED BY H.O.A.:

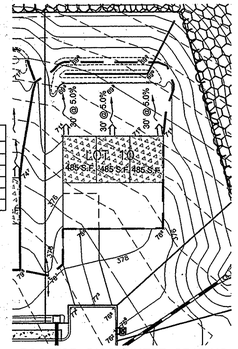
1. FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE SWALE IS ADEQUATELY CONVEYING STORM FLOWS.
2. SIDE SLOPES AND SWALE BOTTOMS SHALL BE MOWED AS NECESSARY TO MAINTAIN LESS THAN 6" IN HEIGHT.
3. DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
4. VISIBLE SIGNS OF EROSION IN THE SLOPES AS WELL AS THE RIP-RAP AREAS SHALL BE REPAIRED AS SOON AS IT IS NOTICED.

NON-ROUTINE MAINTENANCE TO BE PERFORMED BY HOWARD COUNTY:

1. SEDIMENTS SHALL BE REMOVED FROM THE ROADSIDE SWALES AS NECESSARY.

INFILTRATION BERM GEOMETRY TABLE

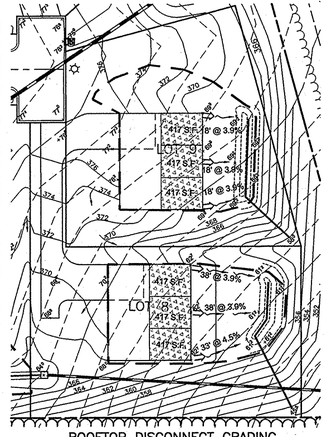
	LOT 11	LOT 12	LOT 13	LOT 14	LOT 15	LOT 16	LOT 17
BOTTOM WIDTH	4.0'	5.0'	4.0'	4.0'	3.9'	3.9'	4.0'
TOP WIDTH	10.0'	11.0'	10.0'	10.0'	9.9'	9.9'	10.0'
LENGTH	56'	56'	56'	56'	56'	42'	48'
TOP ELEVATION (FT)	371.7	372.5	372.0	372.4	371.0	369.0	364.0
BOTTOM ELEVATION (FT)	370.7	371.5	371.0	371.4	370.0	368.0	363.0



ROOFTOP DISCONNECT GRADING AND MICRO-BIORETENTION LOT 10

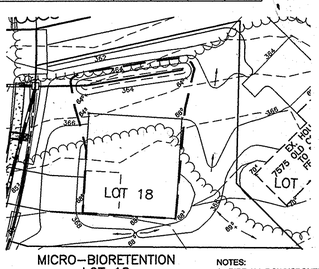
SCALE: 1" = 40'

NOTES:
1. PIPE FRONT DOWNSPOUTS TO DAYLIGHT IN INFILTRATION BERM.
2. GRADE BACK YARDS TO SHEET FLOW PER SPOT SHOTS AND FLOW ARROWS.



ROOFTOP DISCONNECT GRADING AND MICRO-BIORETENTION LOTS 8 AND 9

SCALE: 1" = 40'



MICRO-BIORETENTION LOT 18

SCALE: 1" = 40'

NOTES:
1. PIPE ALL DOWNSPOUTS TO DAYLIGHT IN MICRO-BIORETENTION.

NO.	DATE	REVISION
2	NOV. 2014	REVISED TO ADD UNDERDRAINS TO INFILTRATION BERMS
1	AUG 2010	REDESIGN TO INCORPORATE SWM ESD METHODS, REVISED BY SHEET SUBSTITUTION.

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
60 THOMAS JOHNSON DRIVE ▲ FREDERICK, MARYLAND 21702
(P) 301-371-3005 (F) 301-371-3506
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER 10/20/10

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 21443 Expiration Date: 6-30-11

OWNER/DEVELOPER:

HB DEVELOPMENT, INC.
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20723
410-792-2565

PROJECT:

KINDLER OVERLOOK
LOTS 1-19 AND OPEN SPACE 20
REVISED FINAL ROAD CONSTRUCTION PLAN

LOCATION: TAX MAP: 41 PARCEL: 385, 395, P/O PARCEL 401
GRID: 18 ZONED: R-20
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: STORMWATER MANAGEMENT DETAILS

DATE: JUL 2006 / AUGUST 2010 PROJECT NO. 1328

DESIGN: AAM DRAFT: MAN CHECK: CAM SCALE: AS SHOWN SHEET 8 OF 13

AS-BUILT F-07-003

APPROVED: DEPARTMENT OF PUBLIC WORKS

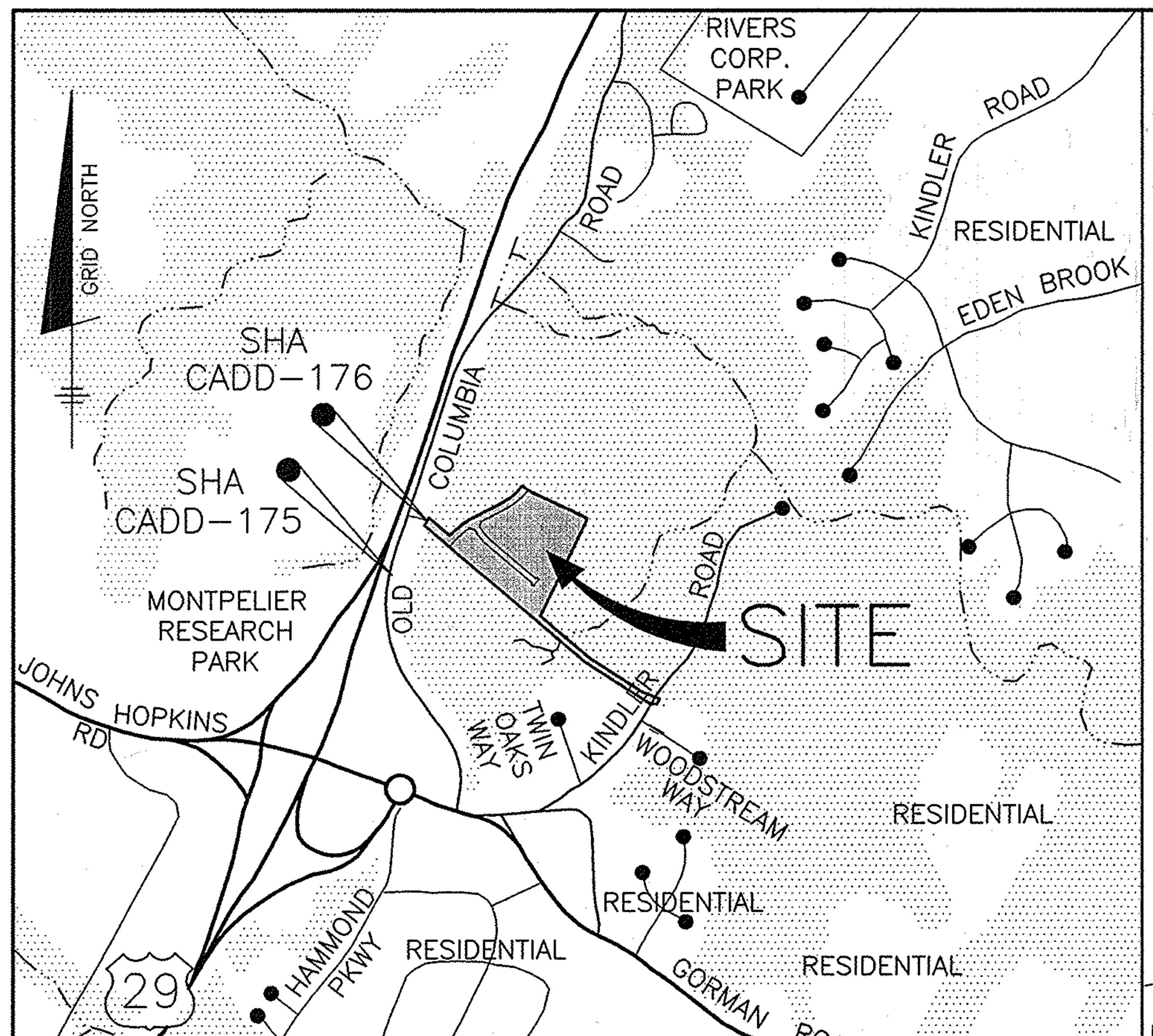
CHIEF, BUREAU OF HIGHWAYS — DATE 11-9-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 12/06/10

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 12/3/10

P:\1328\dwg\0724d08.dwg, Sheet 8, 10/22/2010 3:16:02 PM, odd



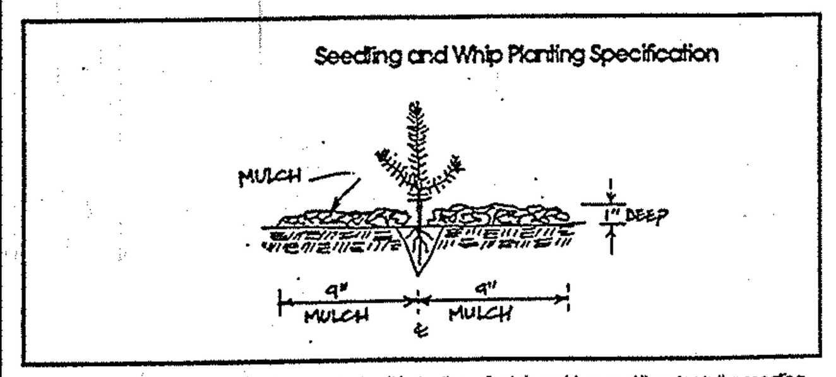
VICINITY MAP

SCALE: 1" = 1000'

ADC MAP 5052 GRID J4

MAP SYMBOL	SOIL TYPE	MAPPING UNIT
Ba *	D	BAILE SILT LOAM
GIB2	B	GLENELG LOAM – 3 TO 8 PERCENT SLOPES – MODERATELY ERODED
GIC2	B	GLENELG LOAM – 8 TO 15 PERCENT SLOPES – MODERATELY ERODED
MgB2	B	MANOR GRAVELLY LOAM – 3 TO 8 PERCENT SLOPES – MODERATELY ERODED
MgC2	B	MANOR GRAVELLY LOAM – 8 TO 15 PERCENT SLOPES – MODERATELY ERODED
MgC3	B	MANOR GRAVELLY LOAM – 8 TO 15 PERCENT SLOPES – SEVERELY ERODED
MIB2	B	MANOR LOAM – 3 TO 8 PERCENT SLOPES – MODERATELY ERODED
MIC2	B	MANOR LOAM – 8 TO 15 PERCENT SLOPES – MODERATELY ERODED
MID2	B	MANOR LOAM – 15 TO 25 PERCENT SLOPES – MODERATELY ERODED
MIE	B	MANOR LOAM – 25 TO 40 PERCENT SLOPES
MnF	B	MANOR VERY STONEY LOAM – 25 TO 60 PERCENT SLOPES
* INDICATES HYDRIC SOILS		HO. CO. SOILS MAP No.29

Seeding and Whip Planting Specification



Mulching newly planted seedlings is suggested as it helps the soil retain moisture and it protects the seedling from compaction and stem injury.

MD DNR Qualified Professional
USACOE Wetland Delineator
Certification # WDCP93MD0610044B2
John P. Canoles

Eco-Science Professionals, Inc.
Consulting Ecologists
P.O. Box 5006 Glen Arm, Maryland 21057 Telephone (410) 592-6752 Fax (410) 833-2400

Forest Conservation Area
AFFORESTATION PROJECT
Trees for Your Future
MIN. 15" MIN. 11"

AFFORESTATION AREA SIGN DETAIL
NOT TO SCALE

FOREST RETENTION AREA
MACHINERY, DUMPING OR STORAGE OF ANY MATERIALS IS PROHIBITED
VIOLATORS ARE SUBJECT TO FINES AS IMPOSED BY THE MARYLAND FOREST CONSERVATION ACT OF 1991
MIN. 15" MIN. 11"

RETENTION AREA SIGN DETAIL
NOT TO SCALE

Planting/Soil Specifications

1. Installation of bareroot/plug plant stock shall take place between March 15 - April 20; b&b/container stock March 15 -May 30 or September 15 - November 15. Fall planting of B&B stock is not recommended.
2. Disturbed areas shall be seeded and stabilized as per general construction plan for project. Planting areas not impacted by site grading shall have no additional topsoil installed.
3. Bareroot plants shall be installed so that the top of root mass is level with the top of existing grade. Roots shall be dipped in an anti-desiccant gel prior to planting. Backfill in the planting pits shall consist of 3 parts existing soil to 1 part pine fines or equivalent.
4. Fertilizer shall consist of Agriform 22-8-2, or equivalent, applied as per manufacturer's specifications, for woody plants. Herbaceous plant shall be fertilized with Osmocote 8-6-12.
5. Plant material shall be transported to the site in a tarped or covered truck. Plants shall be kept moist prior to planting.
6. The contractor shall remove all non-organic debris associated with the planting operation from the site.

Sequence of Constructior.

1. Sediment control shall be installed in accordance with general construction plan for site.
2. Plants shall be installed as per Plant Schedule and the Planting/Soil Specifications for the project.
3. Upon completion of the planting, signage shall be installed as shown.
4. Plantings shall be maintained and guaranteed in accordance with the Maintenance and Guarantee requirements for project.

Maintenance of Plantings

1. Maintenance of plantings shall last for a period of two years.
2. Plantings must receive 2 gallons of water, either through precipitation or watering, weekly during the 1st growing season, as needed. During second growing season, once a month during May-September, if needed.
3. Invasive exotics and noxious weeds will be removed, as required, from planting areas mechanically and/or with limited herbicide. Old field successional species will be retained.
4. Plants shall be examined a minimum two times during the growing season for serious plant pests and diseases. Serious problems will be treated with the appropriate agent.
5. Dead branches will be pruned from plantings.

Guarantee Requirements

1. A 90 percent survival rate of the reforestation plantings will be required after one growing season. All plant material below the 90 percent survival threshold will be replaced at the beginning of the second growing season. At the end of the second growing season, a 75 percent survival rate will be required. All plant material below the 75 percent survival threshold will be replaced by the beginning of the next growing season.

Education of New Occupants

1. The developer shall provide educational information to all property owners within the new development/home about the proper use of forest conservation areas.

Final Inspection and Release of Obligations

1. At the end of the post-construction management and protection period the developer shall submit a certification to the County that all forest conservation areas have remained intact or have been restored to appropriate condition, that the stipulated survival rates have been achieved, and that any permanent protection measures required by the plan are in place. Upon review and acceptance, the County will inform the developed of their release the development of future obligations related to the Forest Conservation Act.

REFORESTATION PLAN

The reforestation area will be placed into a Forest Conservation Easement.

A. Planting Plan and Methods

Plant species selection was based on our knowledge regarding plant communities in Maryland's Piedmont Plateau and information provided in the soil survey on typical vegetation for the soil type on the planting site. Species selection was also based on our knowledge of plant availability in the nursery industry.

Reforestation will be accomplished through a mixed planting of whips and branched transplants. Container grown stock is recommended but bareroot stock may be used to help control afforestation costs. If bareroot stock is used the root systems of all plants will be dipped in an anti-desiccant gel prior to planting to improve moisture retention in the root systems.

Prior to planting the proposed Forest Conservation Easements all multiflora rose in the planting area shall be removed. Removal of the rose may be performed with mowing and herbicide treatments. Physical removal of all top growth following by a periodic herbicide treatment of stump sprouts is recommended. Native tree and shrub species occurring within the rose thickets should be retained wherever possible. Herbicides treatments shall occur on 2 month intervals during the first growing season and once each in the spring and fall for subsequent years. Herbicide used shall be made specifically to address woody plant material and shall be applied as per manufacturers specifications. Care should be taken not to spray planted trees or naturally occurring native tree/shrub seedlings. It is recommended that initiation of rose removal begin at least six months prior to planting.

B. Planting and Soil Specifications

Plant material will be installed in accordance with the Planting Detail and Planting Specifications shown on the Forest Conservation Plan.

Amendments to existing soil will be in accordance with the Planting Specifications shown on the Forest Conservation Plan. Soil disturbance will be limited to individual planting locations.

C. Maintenance of Plantings

For information regarding maintenance of the reforestation plantings, see Section VIII B.

D. Guarantee Requirements

A 90 percent survival rate of the reforestation plantings will be required after one growing season. All plant material below the 90 percent survival threshold will be replaced at the beginning of the second growing season. At the end of the second growing season, a 75 percent survival rate will be required. All plant material below the 75 percent survival threshold will be replaced by the beginning of the next growing season.

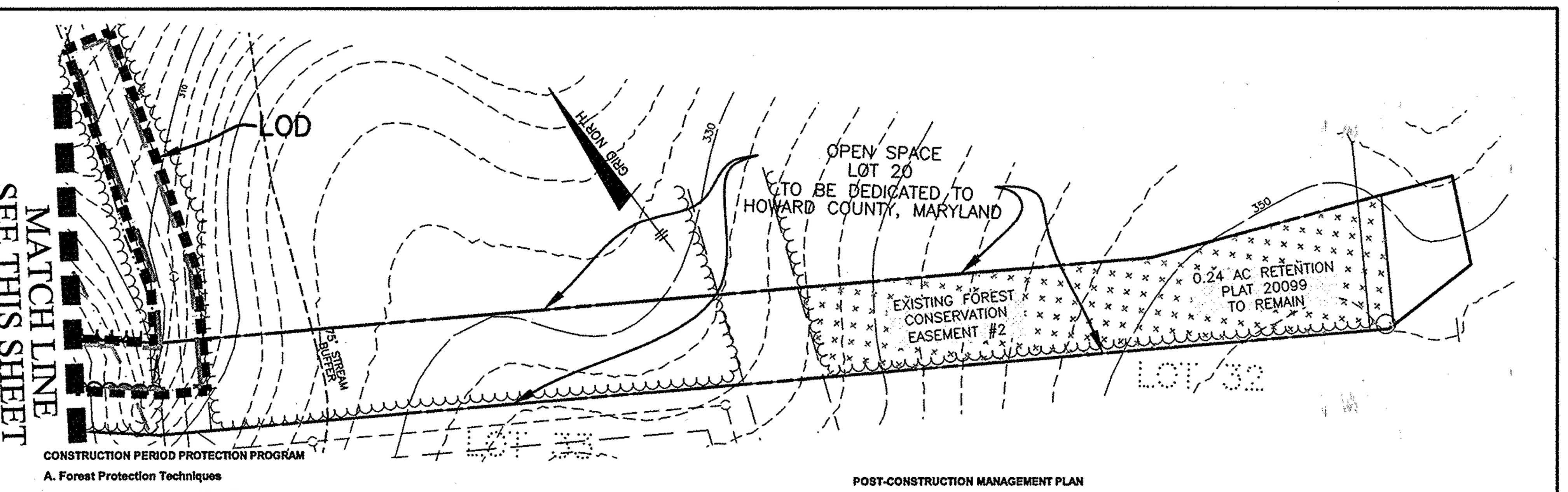
E. Security for Reforestation

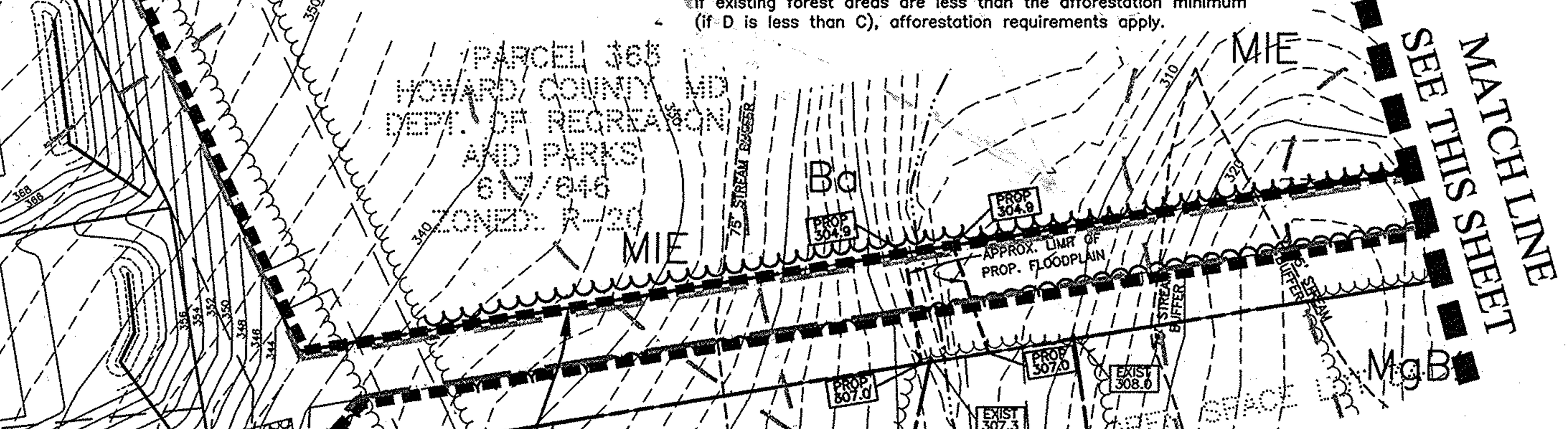
Section 16-1209 of the Howard County Forest Conservation Act requires that a developer shall post a security (bond, letter of credit, etc.) with the County to insure that all work is done in accordance with the FCP.

No As-Built information is required on this sheet

PLAN VIEW

SCALE: 1" = 100'





CONSTRUCTION PERIOD PROTECTION PROGRAM

A. Forest Protection Techniques

1. Soil Protection Area (Critical Root Zone)

The soil protection area, or critical root zone, of a tree is that portion of the soil column where most of a its roots may be found. The majority of roots responsible for water and nutrient uptake are located just below the soil surface. Temporary fencing shall be placed around the critical root zone of the forest in areas where the forest limits occur within 25 feet of the limit of disturbance.

2. Fencing and Signage

Existing forest limits occurring within 25 feet of the limits of disturbance shall be protected using temporary protective fencing. Permanent signage shall be placed around the afforestation area prior to plant installation, as shown on the plan.

B. Pre-Construction Meeting

Upon staking of limits of disturbance a pre-construction meeting will be held between the developer, contractor and appropriate County inspector. The purpose of the meeting will be to verify that all sediment control is in order, and to notify the contractor of possible penalties for non-compliance with the FCP.

C. Storage Facilities/Equipment Cleaning

All equipment storage, parking, sanitary facilities, material stockpiling, etc. associated with construction of the project will be restricted to those areas outside of the proposed Forest Conservation Easement. Cleaning of equipment will be limited to area within the LOD of the proposed homesites. Wastewater resulting from equipment cleaning will be controlled to prevent runoff into environmentally sensitive areas.

D. Sequence of Construction

The following timetable represents the proposed timetable for development. The items outlined in the Forest Conservation Plan will be enacted within two (2) years of subdivision approval.

Below find a proposed sequence of construction.

1. Install all signage and sediment control devices.
2. Hold pre-construction meeting between developer, contractor and County inspector.
3. Build access roads, install well and septic systems, and construct houses. Stabilize all disturbed areas accordingly.
4. Begin multiflora rose removal. Install permanent protective signage for Easements and initiate plantings in accordance with Forest Conservation Plan. Plantings will be completed within two (2) years of subdivision approval.
5. Remove sediment control.
6. Hold post-construction meeting with County inspectors to assure compliance with FCP. Submit Certification of Installation.
7. Monitor and maintain plantings for 2 years.

E. Construction Monitoring

Eco-Science Professionals, or another qualified professional designated by the developer, will monitor construction of the project to ensure that all activities are in compliance with the Forest Conservation Plan.

F. Post-Construction Meeting

Upon completion of construction, Eco-Science Professionals, or another qualified professional designated by the developer, will notify the County that construction has been completed and arrange for a post-construction meeting to review the project site. The meeting will allow the County inspector to verify that afforestation plantings have been installed.

POST-CONSTRUCTION MANAGEMENT PLAN

Howard County requires a two year post-construction management plan be prepared as part of the forest conservation plan. The plan goes into effect upon acceptance of the construction certification of completion by the County. Eco-Science Professionals, or another qualified professional designated by the developer, will be responsible for implementation of the post-construction management plan.

The following items will be incorporated into the plan:

A. Fencing and Signage

Permanent signage indicating the limits of the retention/reforestation area shall be maintained.

B. General Site Inspections/Maintenance of Plantings

Site inspections will be performed a minimum of three times during the growing season. The purpose of the inspections will be to assess the health of the afforestation plantings. Appropriate measures will be taken to rectify any problems which may arise.

In addition, maintenance of the afforestation plantings will involve the following steps:

1. Watering - All plant material shall be watered twice a month during the 1st growing season, more or less frequently depending on weather conditions. During the second growing season, once a month during May-September, if needed.
2. Removal of invasive exotics and noxious weeds. Old field successional species will be retained.
3. Identification of serious plant pests and diseases, treatment with appropriate agent.
4. Pruning of dead branches.
5. After 12 and 24 months, replacement of plants, if required, in accordance with the Guarantee Requirements shown on the FCP.

C. Education

The developer will provide appropriate materials to property owners informing them of the location and purpose of the afforestation area. Materials may include site plans and information explaining the intent of the forest conservation law.

D. Final Inspection

At the end of the two year post-construction management period, Eco-Science Professionals, or another qualified professional, will submit to the administrator of the Howard County Forest Conservation Program certification that all retention/reforestation/afforestation requirements have been met. Upon acceptance of this certification, the County will release the developer from all future obligations and release the developer's bond.

OFFSITE FOREST CONSERVATION REVISION PROPOSAL

	HARLESS FAMILY TRUST F-08-021	TALLEY PARCEL 1 F-07-03-FC2	TALLEY PARCEL 2 F-07-03-FC1
PLATTED UNDER F-07-003	2.50 AC	0.79 AC	1.78 AC
NEEDED UNDER THIS PLAT	2.12 AC	0 AC	0 AC
EXCESS ACREAGE*	0.38 AC	0.79 AC	1.78 AC

*THIS PROJECT IS INCREASING THE ON-SITE RETENTION AND PROVIDING SOME ON-SITE REFORESTATION. THE PREVIOUSLY PLATTED OFF-SITE FOREST CONSERVATION HAS AN EXCESS AREA OF 2.95 ACRES, WHICH WILL BE DESIGNATED TO PROVIDE FOR THE FOREST OBLIGATIONS OF OTHER PROJECTS IN THE FUTURE. (2.45)

ACRES OF AFFORESTATION

(APPENDIX E) FOREST CONSERVATION WORKSHEET

I. BASIC SITE DATA

GROSS SITE AREA (INCLUSIVE OF ALL PROPOSED LOTS) .... 11.54 AC.±
AREA WITHIN 100 YEAR FLOOD PLAIN .... 0.06 AC.
AREA WITHIN AGRICULTURAL USE OR PRESERVATION PARCEL .... 0.0 AC.
NET TRACT AREA .... 11.48 AC.±
LAND USE CATEGORY (R-RLD, R-RMD, R-S, C/I/O, I) .... HDR

II. INFORMATION FOR CALCULATIONS

(A) NET TRACT AREA .... 11.48 AC.±
(B) REFORESTATION THRESHOLD (20% x NTA) .... 2.30 AC.±
(C) AFFORESTATION MINIMUM (15% x NTA) .... 1.72 AC.±
(D) EXISTING FOREST ON NET TRACT AREA .... 10.1 AC.±
(E) FOREST AREAS TO BE CLEARED .... 8.13 AC.±
(F) FOREST AREAS TO BE RETAINED (RETENTION) .... 1.97 AC.±

III. DETERMINING REQUIREMENTS: AFFORESTATION OR REFORESTATION

1. Reforestation
If existing forest areas equal or exceed the afforestation minimum (if D equals or is more than C), and clearing of forest areas is proposed, reforestation requirements may apply.

GO TO SECTION IV

if existing forest areas equal or exceed the afforestation minimum (if D equals or is more than C), and no clearing of existing forest resources is proposed, no reforestation is required. No further calculations are needed.

2. Afforestation
If existing forest areas are less than the afforestation minimum (if D is less than C), afforestation requirements apply.

IV. REFORESTATION CALCULATIONS — ACRES

A. NET TRACT AREA — 11.48
B. REFORESTATION THRESHOLD (20% x A) — 2.30
D. EXISTING FOREST ON NET TRACT AREA — 10.10
E. FOREST AREAS TO BE CLEARED — 8.13
F. FOREST AREAS TO BE RETAINED — 1.97
G. FOREST AREAS CLEARED ABOVE REFORESTATION THRESHOLD — 7.80
(D–F, If F equals or is greater than B, Alternate 1)
(D–B, if F is less than B, Alternate 2)
H. FOREST AREAS CLEARED BELOW REFORESTATION THRESHOLD — 0.33
(B–F, If applicable)
I. FOREST AREAS RETAINED ABOVE REFORESTATION THRESHOLD — 0.00
(F–B, Retention Credit, if applicable)

Clearing below the threshold

If forest areas to be retained are less than the reforestation threshold (if F is less than B), the following calculations apply:

REFORESTATION FOR CLEARING ABOVE THRESHOLD G x 1/4 — 1.95
REFORESTATION FOR CLEARING BELOW THRESHOLD H x 2 — 0.65
TOTAL REFORESTATION REQUIRED (G x 1/4) + (H x 2) — 2.60

Since clearing occurs below the threshold, no forest retention credit is possible

LEGEND

- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING TREELINE
- PROPOSED TREELINE
- MgB2 — SOILS DIVISION LINE
- FOREST CONSERVATION EASEMENT
- LIMIT OF DISTURBANCE

FCP NOTES

1. Any Forest Conservation Easement (FCE) area shown hereon is subject to protective covenants which may be found in the Land Records of Howard County which restrict the disturbance and use of these areas.
2. Forested areas occurring outside of the FCE shall not be considered part of the FCE and shall not be subject to protective land covenants.
3. Limits of disturbance shall be restricted to areas outside the limit of temporary fencing or the FCE boundary, whichever is greater.
4. There shall be no clearing, grading, construction or disturbance of vegetation in the Forest Conservation Easement, except as permitted by Howard County DPZ.
5. No stockpiles, parking areas, equipment cleaning areas, etc. shall occur within areas designated as Forest Conservation Easements.
6. Temporary fencing shall be used to protect forest resources during construction. Fencing shall be installed along limits of disturbance occurring within 50 feet of the proposed FCE limits.
7. Permanent signage will be posted a at 50-100 foot intervals along all FCE limits.
8. The Forest Conservation Act requirements for this project will be met through the onsite retention of 1.97 acres of net tract area forest and 0.48 acres of onsite reforestation within the limits of a Forest Conservation Easement, and offsite reforestation of 2.21 acres on the Harless Farm Trust, Parcel 215, Lot 2. The previously platted off-site forest conservation (Harless Farm and Talley Property) has an excess area of 2.86 acres, which will be designated to proved for the forest obligations of other projects in the future.
9. A surety for the reforestation obligations and the onsite retention proposed will be required. The surety amount has been calculated as follows:

Onsite Retention - 1.97 acres @ $0.20/sq.ft. = $17.163.00
Reforestation - 2.60 acres @ @ $0.50/sq.ft. = ~~$59,590.00~~ $56,628.00

PLANTING SCHEDULE

FCE #3 – Planting Area A – 5,837 sq. ft.
PLANTING UNITS REQUIRED: 94
PLANTING UNITS PROPOSED: 100

QTY.	SPECIES	SIZE	SPACING
14	Cornus florida – FLOWERING DOGWOOD	2–3' WHIP	11' O.C.
8	Liriodendron tulipifera – POPLAR	2–3' WHIP	11' O.C.
8	Quercus alba – WHITE OAK	2–3' WHIP	11' O.C.
20	Viburnum prunifolium – BLACKHAW	2–3' WHIP	11' O.C.

TOTAL 50 WHIPS: WHIP PLANTINGS X 2 UNITS/TREE = FCA CREDIT:100 UNITS

FCE #3 – Planting Area B – 15,278 sq. ft.
PLANTING UNITS REQUIRED: 245
PLANTING UNITS PROPOSED: 260

QTY.	SPECIES	SIZE	SPACING
15	Acer rubrum – RED MAPLE	2–3' WHIP	11' O.C.
25	Cornus florida – FLOWERING DOGWOOD	2–3' WHIP	11' O.C.
25	Liriodendron tulipifera – POPLAR	2–3' WHIP	11' O.C.
15	Prunus serotina – BLACK CHERRY	2–3' WHIP	11' O.C.
20	Quercus alba – WHITE OAK	2–3' WHIP	11' O.C.
30	Viburnum prunifolium – BLACKHAW	2–3' WHIP	11' O.C.

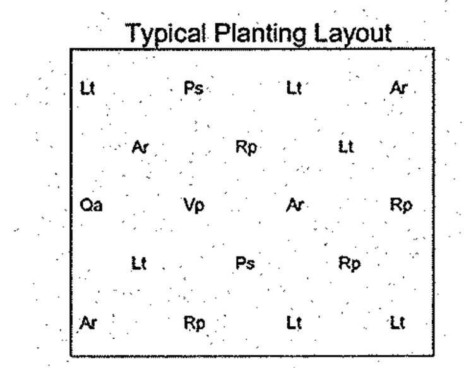
TOTAL 130 WHIPS: WHIP PLANTINGS X 2 UNITS/TREE = FCA CREDIT:260 UNITS

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No. 21443 , Expiration Date: 12-21-14

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER — 7-13-14

Typical Planting Layout



This diagram shows a typical dispersal of species within planting area. The spacing shall be in accordance with the approved planting schedule. Where the size of the planting stock varies, the planting units shall installed at averaged spacing to provide approximately uniform coverage.

Planting Notes:

Planting density based spacing: whips with shelter @ 11' on center.

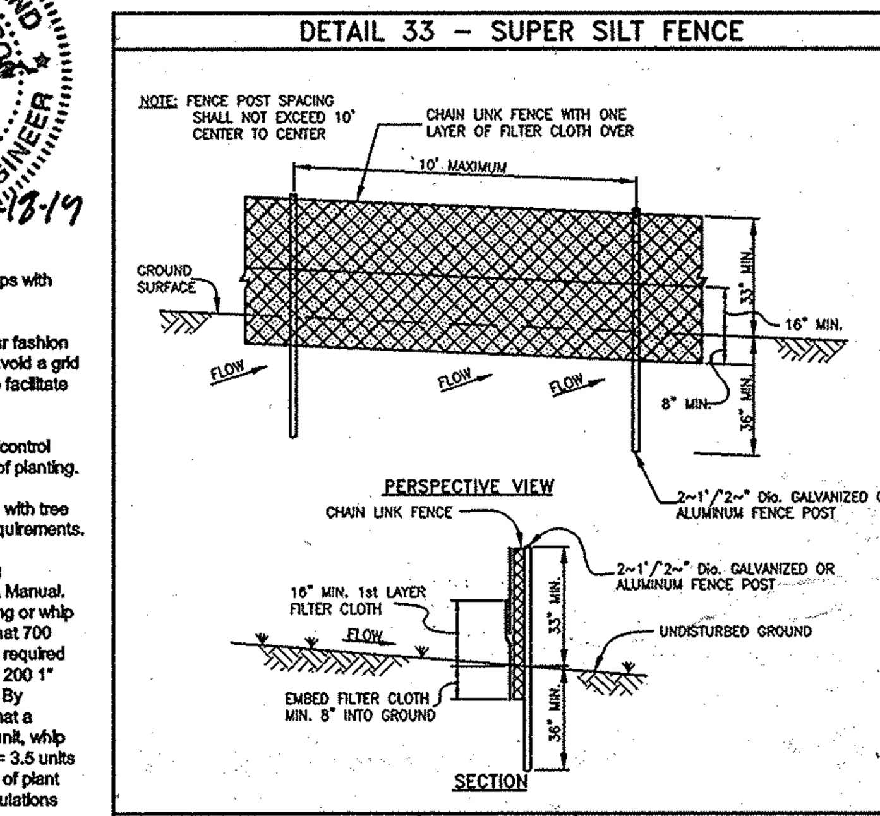
Planting may be made in a curvilinear fashion along contour. The planting should avoid a grid appearance but should be spaced to facilitate maintenance

Multiflora rose/heavy brush removal/control may be required prior to installation of planting.

All whips are required to be installed with tree shelters per Howard County FCA requirements.

Planting units defined by the spacing requirements established in the FCA Manual. One plant unit is defined as 1 seedling or whip without shelter. The Manual states that 700 seedlings/whips without shelters are required per acre, or 350 whips w/shelters, or 200 1" caliper trees, or 100 2" caliper trees. By conversion it has been determined that a seedling or whip without shelter = 1 unit, whip with shelter = 2 units, 1"caliper tree = 3.5 units and 2" caliper tree =7 units. The use of plant units simplifies the plant density calculations when mixing stock size.

DETAIL 33 – SUPER SILT FENCE



U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE H – 26 – 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 11-9-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 12/06/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 12/3/10

NO.	DATE	REVISION
1	AUG 2010	REDESIGN TO INCORPORATE SWM ESD METHODS, REVISED BY SHEET SUBSTITUTION.

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
60 THOMAS JOHNSON DRIVE ▲ FREDERICK, MARYLAND 21702
(P) 301-371-3505 (F) 301-371-3506
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND PROFESSIONAL ENGINEER 10/27/10

OWNER/DEVELOPER:
HB DEVELOPMENT, INC.
9691 NORFOLK AVENUE
LAUREL, MARYLAND 20723
410-792-2565

PROJECT:
KINDLER OVERLOOK
LOTS 1–19 AND OPEN SPACE 20
REVISED FINAL ROAD CONSTRUCTION PLAN

LOCATION: TAX MAP: 41 GRID: 18 P/O PARCEL: 385 AND 395 ZONED: R-20
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE:
FOREST CONSERVATION PLAN

DATE: JULY 2006 / AUGUST 2010 — PROJECT NO. 1328
DESIGN: CAM — DRAFT: MAN — CHECK: CAM — SCALE: AS SHOWN — SHEET 9 OF 13

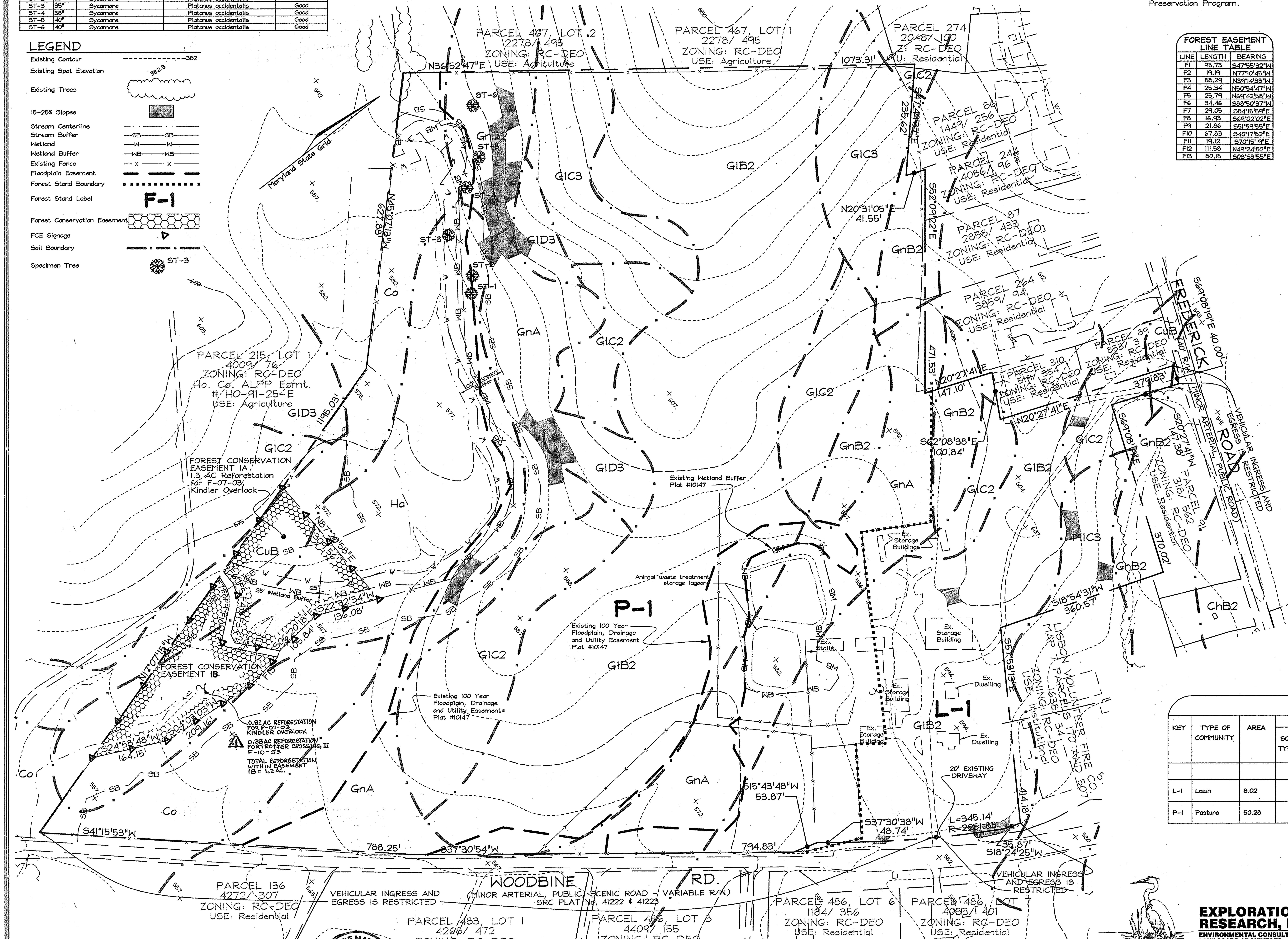
AS-BUILT F-07-003

SPECIMEN TREES

NO.	DBH	COMMON NAME	SCIENTIFIC NAME	CONDITION
ST-1	32"	Sycamore	Platanus occidentalis	Good
ST-2	36"	Sycamore	Platanus occidentalis	Good
ST-3	35"	Sycamore	Platanus occidentalis	Good
ST-4	38"	Sycamore	Platanus occidentalis	Good
ST-5	40"	Sycamore	Platanus occidentalis	Good
ST-6	40"	Sycamore	Platanus occidentalis	Good

LEGEND

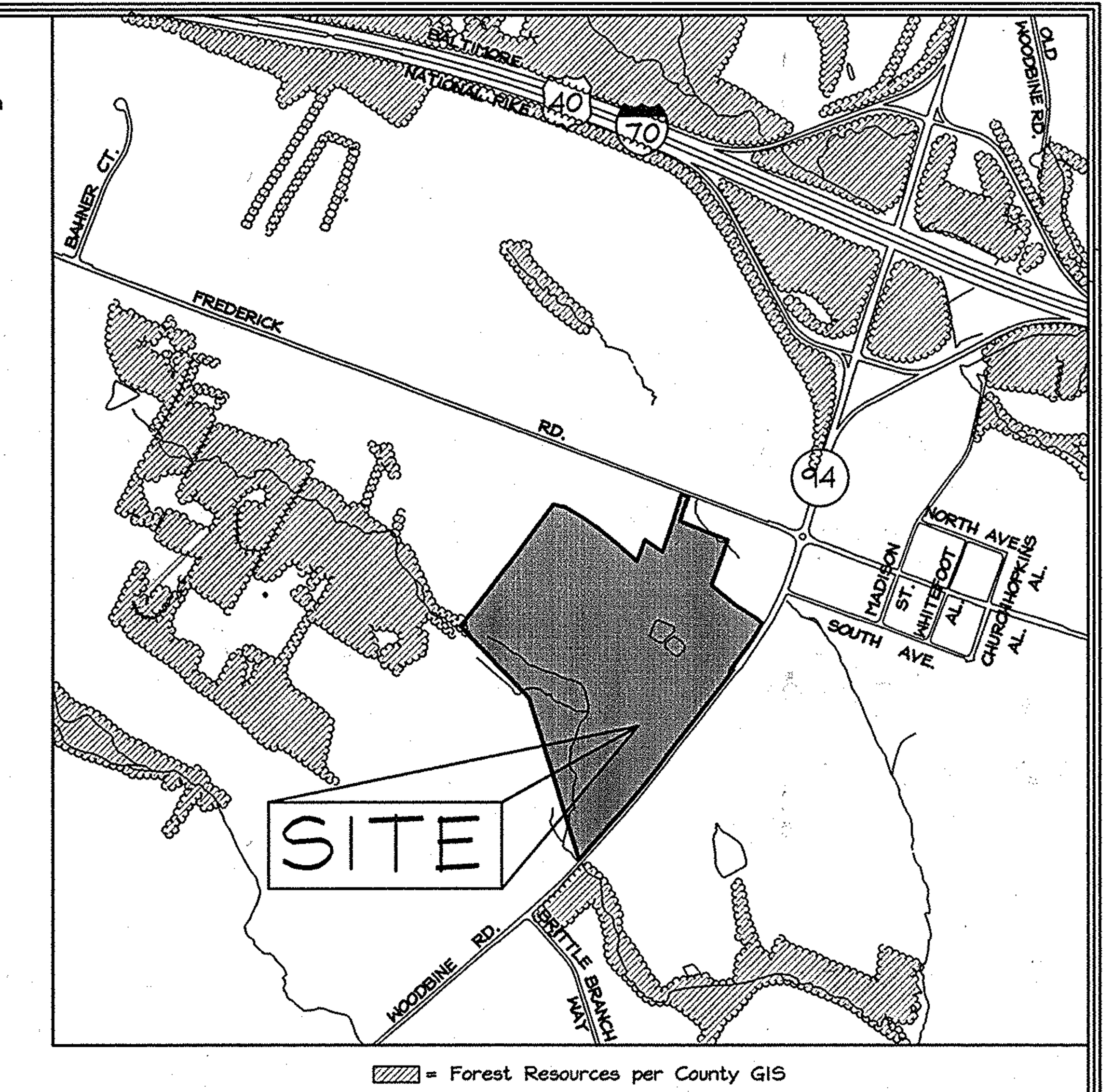
Existing Contour — 382
Existing Spot Elevation — 382.3
Existing Trees
15-25% Slopes
Stream Centerline
Stream Buffer — SB
Wetland — W
Wetland Buffer — WB
Existing Fence — X
Floodplain Easement
Forest Stand Boundary
Forest Stand Label — F-1
Forest Conservation Easement
FCE Signage
Soil Boundary
Specimen Tree — ST-3



This property is encumbered with a Ho. Co. Agricultural Land Preservation Easement, HO-91-24-E, which is held by the Ho. Co. Agricultural Land Preservation Program.

FOREST EASEMENT LINE TABLE

LINE	LENGTH	BEARING
F1	95.73	S47°55'32"W
F2	19.19	N77°10'45"W
F3	58.29	N39°14'38"W
F4	25.34	N50°54'47"W
F5	25.79	N69°42'58"W
F6	34.46	S88°50'37"W
F7	29.05	S84°15'59"E
F8	16.93	S69°02'02"E
F9	21.86	S51°59'55"E
F10	67.83	S40°17'52"E
F11	19.12	S70°15'19"E
F12	111.58	N49°24'52"E
F13	80.15	S08°58'55"E



= Forest Resources per County GIS

VICINITY MAP
SCALE:1=1000'

GENERAL NOTES

1. Per a search on the MERLIN website on October 11, 2007, the subject property contains no steep slopes greater than 25%, no rare, threatened or endangered species or critical habitats for rare, threatened or endangered species, no historic structures or other historic resources (including trees and cemeteries).
2. No power lines were surveyed at this time because none are located near planting area.
3. Floodplain area per plat #10147 = 15.54 Ac.
4. This plan is associated with plat F-08-021.

SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	SOIL GROUP	K VALUE
Co	Codorus silt loam	C	0.49
CuB	Comus silt loam, local alluvium, 3 to 8 percent slopes	B	0.43
GIB2	Glenelg loam, 3 to 8 percent slopes, moderately eroded	B	0.32
GIC2	Glenelg loam, 8 to 15 percent slopes, moderately eroded	B	0.32
GIC3	Glenelg loam, 8 to 15 percent slopes, severely eroded	B	0.32
GID3	Glenelg loam, 15 to 25 percent slopes, severely eroded	B	0.32
GnA	Glenville silt loam, 0 to 3 percent slopes	C	0.32
GnB2	Glenville silt loam, 3 to 8 percent slopes, moderately eroded	C	0.32
Ha*	Hatboro silt loam	D	0.32
MIC3	Manor loam, 8 to 15 percent slopes, severely eroded	B	0.32

* Hydric Soils

Forest Stand Delineation Narrative

This Forest Stand Delineation was prepared in accordance with the Howard County Forest Conservation Manual.

L1 and P1 The Pasture and Lawn areas contain scattered trees and shrubs along the existing stream and around the existing house sites. The pasture is actively used for cattle grazing. An easement is being created along the existing stream. There are no specimen trees within the proposed easement.

There are minor areas of 15-25% slopes on the site as indicated on the plan.

FOREST STAND ANALYSIS TABLE

KEY	TYPE OF COMMUNITY	AREA	SOIL INFORMATION				EXISTING VEGETATION (Type and approx. %)	STAND CHARACTERISTICS			FOREST AREA IN SENSITIVE ENVIRONMENTS
			SOIL TYPE	TYPICAL FOREST COVER	WOODLAND SUITABILITY INDEX	HABITAT VALUE		SIZE AVG. DIAM	AGE	GENERAL CONDITIONS	
			NO ON-SITE FOREST RESOURCES EXIST								
L-1	Lawn	8.02									
P-1	Pasture	50.28									

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[signature] 1/4/08
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

[signature] 1/4/08
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

~~DIRECTOR~~ ~~DATE~~

STATE OF MARYLAND — CHRISTOPHER ALAN MALAGARI — No. 22894 — REGISTERED PROFESSIONAL ENGINEER

For Rev. #1 only 10-25-10

NO	DATE	REVISION	BY
1	10-22-10	SHOW THE BRAKE DOWN OF REFORESTATION ON FCE 1B	BEI

No As-Built information is required on this sheet

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER
9-18-14

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-14

EXPLORATION RESEARCH, INC.
ENVIRONMENTAL CONSULTANTS
LANDSCAPE ARCHITECTS
6339 HOWARD LANE
ELKRIDGE, MARYLAND 21075
TEL: (410) 567-5210 FAX (410) 796-1562

OWNER
Harless Farm Trust
14965 Frederick Road
Woodbine, MD 21797

OFFSITE FOREST MITIGATION PLAN
for KINDLER OVERLOOK
(LOTS 1-19 and Open Space Lot 20)
on E. ALEXANDER ADAMS AND MARION HARLESS PROPERTY

TAX MAP 7 GRID 11 & 17 — PARCEL 215
4TH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

STATE OF MARYLAND — STEPHEN L. HIDER — No. 363 — REGISTERED PROFESSIONAL FORESTER

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane, Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY: --
DRAWN BY: SMM
CHECKED BY: SH
SCALE: 1" = 100'
DATE: Dec. 18, 2007
W.O. No.: 3336
SHEET No.: 10 OF 13

AS-BUILT

F-07-03

M:\Harless 3336\dwg\Forest_Bank_Kindler\3336_s1_kindler.dwg, 12/17/2007 11:26:15 AM, smarmon, 1:1

Easement 1A: PLANTING AREA: 1.3 Ac.

Qty	Botanical Name	Common Name	Size	Credit/Plant	Total Credit
43	Acer rubrum	Red Maple	1" cal.	217.8	9365.4
43	Betula nigra	River Birch	1" cal.	217.8	9365.4
43	Cercis canadensis	Redbud	1" cal.	217.8	9365.4
43	Liquidambar styraciflua	Sweetgum	1" cal.	217.8	9365.4
44	Platanus occidentalis	Sycamore	1" cal.	217.8	9583.2
44	Quercus palustris	Pin Oak	1" cal.	217.8	9583.2

260 Total Plantings 56,628 s.f. = 1.3 Ac.

Easement 1B: PLANTING AREA: 1.2 Ac.

Qty	Botanical Name	Common Name	Size	Credit/Plant	Total Credit
40	Acer rubrum	Red Maple	1" cal.	217.8	8712
40	Betula nigra	River Birch	1" cal.	217.8	8712
40	Cercis canadensis	Redbud	1" cal.	217.8	8712
40	Liquidambar styraciflua	Sweetgum	1" cal.	217.8	8712
40	Platanus occidentalis	Sycamore	1" cal.	217.8	8712
40	Quercus palustris	Pin Oak	1" cal.	217.8	8712

240 Total Plantings 52,272 s.f. = 1.2 Ac.

FOREST CONSERVATION EASEMENT TABLE

EASEMENT	TYPE	AREA (ACRES)
1A	Reforestation	1.3
1B	Reforestation	1.2
TOTAL		2.5

Planting Areas Description

The proposed planting areas totalling 2.5 Ac. is proposed entirely within stream buffer, wetland, and wetland buffer areas. The current land use is pasture, making it an ideal area to plant and provide a forested stream buffer.

Planting will utilize a variety of species as shown in the proposed planting schedule. Stock will be randomly placed per the details on this sheet. All container grown stock will utilize tree shelters. The entire area will be stabilized with the described seed mix cover crop.

Plant Selection and Density Spacing Requirements.

Planting Material Size and Density Planting:
Planting size and density shall be varied with a combination of planting stock. Planting quantity and spacing are based on square footage credit, which varies by material size. A total of 43,560 sq. ft. of planting credit must be fulfilled for each acre planted. This credit can be fulfilled with any combination of material size in accordance with the following chart.

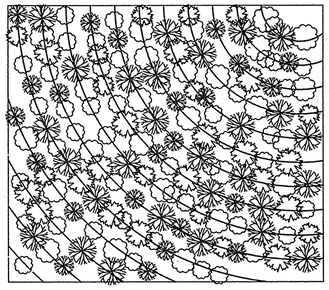
Plant Material Size Table.

Material Size	Spacing	TPA	Sq. Ft. Credit per Plant	Comments
2" caliper trees	20' x 20'	100	435.6	B & B
1" caliper trees	15' x 15'	200	217.8	B & B
seedlings or whips	11' x 11'	350	125	Container 1-3 gal w/tree shelters
seedlings or shrubs	8' x 8'	700	62	Bare root

Native Seed Mix

Percentage	Botanical Name	Common Name
25%	Agrostis alba	Redtop
25%	Carex vulpinoides	Fox Sedge
25%	Alopecurus pratensis	Meadow Fox Tail
20%	Andropogon scoparius	Little Bluestem
5%	Chrysanthemum leucan themum	Ox Eye Daisy

CURVILINEAR RANDOMIZED PLANTING



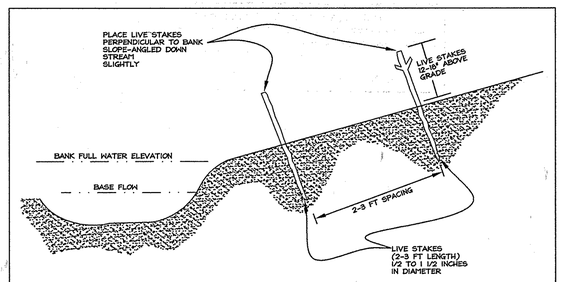
PLANT PLACEMENT DETAIL
NOT TO SCALE

1. MIX TREE AND SHRUB SPECIES IN THE STAGING AREA.
2. SET THE GUIDE CURVILINEAR LINE AS CLOSE TO CONTOUR AS POSSIBLE.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1/4/08

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/4/08



TYPICAL LIVE STAKE PLANTING DETAIL
CROSS-SECTION VIEW (NOT TO SCALE)

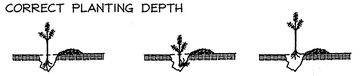
SPECIFICATIONS FOR LIVE STAKING

1. All cuttings shall be freshly cut from live woody plants of the species indicated, such as willow, alder, and shrub dogwood, during the dormant season.
2. Basal end of stake should be cut on an angle with the top cut square.
3. Prepare cuttings from dormant .5 in. to 2 in. diameter stock cut in 18in. to 3 feet long stakes.
4. Keep cuttings moist at all times.
5. Install stakes with deadblow hammer, angled downstream, on 3.0 ft. centers.
6. Replace live stakes that split or become mushroomed.
7. Install stakes with buds pointing upwards.

SEEDLING AND WHIP PLANTING

NOTE: MULCHING NEWLY PLANTED SEEDLINGS HELPS THE SOIL RETAIN MOISTURE AND THE SEEDLING FROM COMPACTION AND STEM INJURIES.

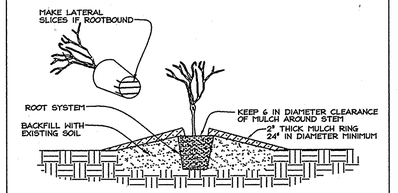
CORRECT PLANTING DEPTH



CORRECT
AT SAME DEPTH AS SEEDLING WAS GROWN IN NURSERY

INCORRECT
TOO DEEP AND ROOT IS BENT

INCORRECT
TOO SHALLOW AND ROOTS ARE EXPOSED

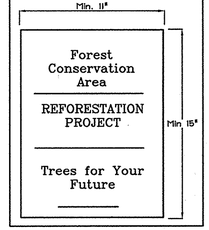


CONTAINER PLANTING
NOT TO SCALE

PLANTING PROCEDURE FOR CONTAINER GROWN PLANTS

1. REMOVE THE PLANT EITHER BY CUTTING OR INVERTING THE CONTAINER
2. USE A KNIFE TO CUT THROUGH BOTTOM HALF OF THE ROOT BALL.
3. PLANT SHRUBS ON FORMED UP MOUNDS 4" ABOVE THE EXISTING GRADE WHEN HIGH WATER TABLE CONDITIONS EXIST, OTHERWISE PLANT FLUSH WITH EXISTING GRADE.
4. PLANTING HOLE TO BE 2-3 TIMES THE DIAMETER OF THE CONTAINER.
5. INSERT FERTILIZER TABLET, BACKFILL 2/3 OF THE ROOT BALL AND WATER.
6. AFTER WATER PERCOLATES, BACKFILL HOLE TO TOP OF ROOT BALL AND GENTLY TAMP SOIL TO FIRM CONTACT WITH PLANT.
7. APPLY MULCH RING AROUND PLANT KEEPING A 6 IN CLEARANCE FROM STEM.

Reforestation and Afforestation Area Protection Signage



SIGN DETAIL: PERMANENT SIGN

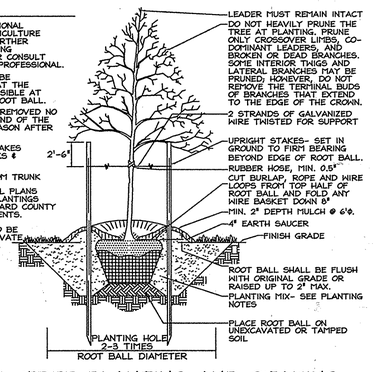
SIGNAGE NOTE: All tree protection signs shall be placed on metal 'T' posts or pressure treated wood poles. No attachment of signs to trees is permitted. Signs shall be placed every 75' to 100' as shown on plan view. Signage shall remain in place in perpetuity.

Reforestation Area Planting Notes

1. Initial planting inspection and certification required. Planting contractor to notify ERI qualified professional 24 hours in advance of planting.
2. Reforestation areas may be planted as soon as reasonable to do so. Late winter- early spring plantings are preferred. Earliest planting dates will vary from year to year but planting may generally begin as soon as the ground is no longer frozen. Alternate planting dates may be considered as conditions warrants.
3. Soil amendments and fertilization recommendations will be made based upon the results of soil analysis for nitrogen, phosphorus, potassium, organic matter content and pH. If required, fertilizer will be provided using a slow release, soluble 16-8-16 analysis designed to last 5-8 years contained in polyethylene perforated bags such as manufactured by ADCO Works, P.O. Box 310 Hollins, N.Y. 11423 or approved equal.
4. Plant materials shall be planted in accordance with the planting diagram, planting details and planting schedule.
5. Plant stock must be protected from desiccation at all times prior to planting. Materials held for planting shall be moistened and placed in cool shaded areas until ready for placement.
6. Planting materials shall be nursery grown and inspected prior to planting. Plants not conforming to the American Standards for Nursery Stock specifications for size, form, vigor, or roots, or due to trunk wounds, breakage, desiccation, insect or disease must be replaced.
7. Newly planted trees may require watering at least once per week during the first growing season depending on rainfall in order to get established. The initial planting operation should allow for watering during installation to completely soak backfill materials.
8. Mulch shall be applied in accordance with the diagram provided and shall consist of composted, shredded hardwood bark mulch, free of wood alcohol.
9. Planting holes should be excavated to a minimum diameter of 2.5 to 3 times the diameter of the root ball or container. Mechanical auguring is preferred with scarification of the sides of each hole.
10. All nursery stock may be sprayed with deer repellent containing Bitrex such as Repellex(TM). All nursery stock to be grown with deer repellent tablets in growing medium, such as Repellex Tablets.

NOTES

1. CONSULT INTERNATIONAL SOCIETY OF ARBORICULTURE GUIDELINES FOR FURTHER DETAILS OF PLANTING SPECIFICATIONS, OR CONSULT WITH A QUALIFIED PROFESSIONAL.
2. EACH TREE SHALL BE PLANTED SUCH THAT THE TRUNK FLARE IS VISIBLE AT THE TOP OF THE ROOT BALL.
3. STAKES SHALL BE REMOVED NO LATER THAN THE END OF THE FIRST GROWING SEASON AFTER PLANTING.
4. PLACE UPRIGHT STAKES PARALLEL TO WALKS & BUILDINGS.
5. KEEP MULCH 1" FROM TRUNK
6. SEE ARCHITECTURAL PLANS FOR ADDITIONAL PLANTINGS WHICH EXCEED HOWARD COUNTY MINIMUM REQUIREMENTS.
7. TREES ARE NOT TO BE PLANTED OVER PRIVATE SEWAGE EASEMENT.



TYPICAL TREE PLANTING AND STAKING
DECIDUOUS TREES UP TO 2-1/2" CALIPER — NOT TO SCALE

No As-Built information is required on this sheet

STATE OF MARYLAND — DONALD ALAN SMARR — No. 21443 — PROFESSIONAL ENGINEER

9-18-14

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No. 21443 Expiration Date: 12-21-14

POST-CONSTRUCTION MANAGEMENT PROGRAM

Reforestation Area Monitoring Notes

1. Monthly visits during the first growing season are to assess the success of the plantings and to determine if supplemental watering, pest control, invasive plant management, mowing or other actions are necessary. Early spring visits will document winter kill and autumn visits will document summer kill.
2. The minimum survival rate shall be 75% of the total number of trees planted per acre at the end of the two year maintenance period. Wild tree seedlings from natural regeneration on the planting site may be counted up to 50% toward the total survival number if they are healthy native species at least 12 inches tall.
3. Survival will be determined by a stratified random sample of the plantings. The species composition of the sample population should be proportionate to the amount of each species in the entire planting to be sampled.
4. Effective monitoring will assess plant survivability during the first growing season and make recommendations for reinforcement planting if required at that time.

Forest Tree Protection and Management Notes

1. Any significant changes made to the Forest Conservation Plan shall be made with the prior approval if the Howard County Dept. Of Planning and Zoning.
2. Forest protection and management to be in accordance with a forest management plan. The plan shall be prepared by a MD. licensed forester to facilitate the landowners management objectives, such as wildlife enhancement, water quality, aesthetics, forest products, etc.
3. Future forest harvests may be conducted under a Howard County approved forest harvest plan, prepared by a MD. licensed forester.

EXPLORATION RESEARCH, INC.
ENVIRONMENTAL CONSULTANTS
LANDSCAPE ARCHITECTS
6339 HOWARD LANE
ELKRIDGE, MARYLAND 21075
TEL: (410) 567-5200 FAX: (410) 796-1562

Surety in the amount of $54,450.00 shall be posted as part of the Developer's Agreement for Kindler Overlook, F-07-03, for 2.5 ac/108,900 sq. ft.

OWNER
Harless Farm Trust
14965 Frederick Road
Woodbine, MD 21797

OFFSITE FOREST MITIGATION PLAN for KINDLER OVERLOOK

(LOTS 1-19 and Open Space Lot 20)
on E. ALEXANDER ADAMS AND MARION HARLESS PROPERTY

TAX MAP 7 GRID 11 & 17 PARCEL 215
4TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

STATE OF MARYLAND — STEPHEN L. HISER — No. 21439 — PROFESSIONAL ENGINEER

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane, Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: [illegible]

DESIGN BY: [illegible]
DRAWN BY: RAB/SHM
CHECKED BY: SLH
SCALE: As Shown
DATE: Dec 18, 2007
F.C.P. No.: 3336
SHEET No.: 11 OF 18

AS-BUILT

F-07-[illegible]

M:\Harless 3336\dwg\Forest_Bank_Kindler\3336_s2_kindler.dwg, 12/17/2007 11:27:57 AM, smarmon, 1:1

BY	DATE	REVISION	NO
BEI	3-17-13	REVISE AC OF REFORESTATION FOR TROTTERS POINT	3
BEI	6-20-16	REVISE AC OF REFORESTATION FOR KINDLER OVERLOOK II	4
BEI	7-26-2024	IDENTIFY 0.2 ACRES OF FCM EASEMENT #8 FOR F-24-048 AND ADD CHART	7

As-Built information is required on this sheet

STATE OF MARYLAND — DONALD ALAN MASON — No. 21403 — PROFESSIONAL ENGINEER — 9-18-14

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21403 Expiration Date: 12-21-14

See Sheet 13 of 13 for Vicinity Map

Forest Conservation Easement #8			
Initial Acreage:		1.78	
File Number	Project Name	Obligation (ac)	Amount Remaining (ac)
F-08-038	Rocky Gorge Overlook	0.42	1.36
F-13-004	Trotter Point	0.47	0.89
F-16-049	Kindler Overlook III	0.39	0.50
F-24-048	Pointers View	0.20	0.30

DAISY ROAD (Major Collector) (60' R/W)

TALLEY PROPERTY PARCEL 481 5902/ 481 PARCEL 1

TALLEY PROPERTY PARCEL 392 5902/ 481 PARCEL 2

JORDANS CACHE LOT 1 ZONING RC-DEO PLAT # 13590

JORDANS CACHE LOT 2 ZONING RC-DEO PLAT # 13590

ZONING RC-DEO PARCEL 345 4653/ 296

EX. DWELLING

EX. DWELLING AND ACCESSORY STRUCTURES

EX. BARN

EX. DRIVEWAY

EX. HOUSE

EX. SHED

EXISTING FOREST CONSERVATION EASEMENT 1 - 2.26 AC for F-04-54, Scott Farm

EXISTING FOREST CONSERVATION EASEMENT 2 - 1.12 AC for F-04-170, Hickory Point

EXISTING FOREST CONSERVATION EASEMENT 3 - 0.45 AC for F-04-170, Hickory Point

EXISTING FOREST CONSERVATION EASEMENT 4 - 0.82 AC for F-04-170, Hickory Point

EXISTING FOREST CONSERVATION EASEMENT 5 - 0.42 AC for F-05-12, Trotters Run

EXISTING FOREST CONSERVATION EASEMENT 6 ± 1.06 AC for F-05-12, Trotters Run

EXISTING FOREST CONSERVATION EASEMENT 7 - 0.80 AC for F-05-55, Scott Farm

FOREST CONSERVATION EASEMENT 8 - 0.47± AC REFORESTATION FOR TROTTERS POINT F-13-004

FOREST CONSERVATION EASEMENT 9 - 0.17 ac REFORESTATION FOR TROTTERS CROSSING II F-10-53

FOREST CONSERVATION EASEMENT 9 - 0.04 ac REFORESTATION FOR ROCKY GORGE OVERLOOK F-08-38

0.12 AC REFORESTATION FOR ROCKY GORGE OVERLOOK F-08-038

0.39 RE FORESTATION FOR KINDLER OVERLOOK III F-16-049

0.30 AC UNDESIGNATED

0.20 AC PLANTING FOR POINTERS VIEW, F-24-048

NEW EASEMENT AREAS for F-07-03, KINDLER OVERLOOK

Maryland State Grid

SOILS LEGEND		
SYMBOL	NAME / DESCRIPTION	SOIL GROUP
ChB2	Chester silt loam, 3 to 8 percent slopes, moderately eroded	B
Co	Codorus silt loam	C
CuB	Cornus silt loam, local alluvium, 3 to 8 percent slopes	B
GIB2	Glenelg loam, 3 to 8 percent slopes, moderately eroded	B
GIC2	Glenelg loam, 8 to 15 percent slopes, moderately eroded	B
GIC3	Glenelg loam, 8 to 15 percent slopes, severely eroded	B
GID2	Glenelg loam, 15 to 25 percent slopes, moderately eroded	B
GID3	Glenelg loam, 15 to 25 percent slopes, severely eroded	B
GnA	Glenville silt loam, 0 to 3 percent slopes	C
GnB2	Glenville silt loam, 3 to 8 percent slopes, moderately eroded	C
Ha	Hatboro silt loam	D
MIB2	Manor loam, 3 to 8 percent slopes, moderately eroded	B
MIC2	Manor loam, 8 to 15 percent slopes, moderately eroded	B
MIC3	Manor loam, 8 to 15 percent slopes, severely eroded	B
MID2	Manor loam, 15 to 25 percent slopes, moderately eroded	B
MID3	Manor loam, 15 to 25 percent slopes, severely eroded	B
MtE	Mt. Airy channery loam, 25 to 45 percent slopes	A

STATE OF MARYLAND — STEPHEN L. HESS — No. 288 — REGISTERED PROFESSIONAL FORESTER

LEGEND

	Proposed	Existing
Forest Easement Signage		
Forest Conservation Easement		
Existing Forest Conservation Easement		
Steep Slopes 15-24.9%		
Steep Slopes >25%		

Existing Contour 5	
Existing Contour 25	375
Property Boundary Line	
Soils Division Line	
Forest Stand Type Boundary	
Existing Stream	
Stream Buffer	SB
Wetlands	W
Wetlands Buffer	WB

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1/4/08

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/4/08

07.29.2024 — For Revision/7 Only

Surety in the amount of $55,974.50 shall be posted as part of the Developer's Agreement for 2.57 ac/111,949 sq. ft.

NO.	DATE	REVISION	BY
2	5-30-12	ADD 0.47AC REFORESTATION FOR #4 FROM 0.44 TO 0.64	BEI
1	10-25-10	ADD 0.30AC UNDESIGNATED FOR FOREST CONSERVATION OBLIGATION FOR F-08-038 AND 0.12AC REFORESTATION FOR F-08-038	BEI

This property is encumbered with a Ho. Co. Agricultural Land Preservation Easement, HO-03-02-PPSD, which is held by the Ho. Co. Agricultural Land Preservation Program.

STATE OF MARYLAND — CHRISTOPHER ALAN MALAMPHY — No. 21403 — PROFESSIONAL ENGINEER

FOR REV. BY BELCHMARK ENGINEERING 10-25-10 REV 1, 2

OWNER
Talley Family LLP
1525 Daisy Road
Woodbine, MD 21797
410-442-2300

FSH Associates
Engineer Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1865

OFFSITE FOREST MITIGATION PLAN for KINDLER OVERLOOK

(LOTS 1-19 and Open Space Lot 20)
on Talley Property Parcel 1 & 2
RE-03-02 DS2, P.N. 15816, F-04-054 FC, P.N. 17192 &
RE-03-02 DS1, P.N. 15815, F-03-28-S, P.N. 16071
TAX MAP 8 GRID 13 — PARCEL 392 & 481
4TH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

EXPLORATION RESEARCH, INC.
ENVIRONMENTAL CONSULTANTS
LANDSCAPE ARCHITECTS
6330 HOWARD LANE
ELKRIDGE, MARYLAND 21075
TEL: (410) 567-5210 FAX: (410) 796-1582

DESIGN BY:	RAB
DRAWN BY:	SMM
CHECKED BY:	SLH
SCALE:	1"=100'
DATE:	Dec. 18, 2007
W.O. No.:	2421
SHEET No.:	12 OF 13

As-Built

F-07-03

FOREST STAND ANALYSIS TABLE

KEY	TYPE OF COMMUNITY	AREA Acres	SOIL INFORMATION				EXISTING VEGETATION (Type and approx. %)	STAND CHARACTERISTICS			FOREST AREA IN SENSITIVE ENVIRONMENTS
			SOIL TYPE	TYPICAL FOREST COVER	WOODLAND SUITABILITY INDEX	HABITAT VALUE		SIZE AVG. DIAM	AGE	GENERAL CONDITIONS	
F-1	Upland Hardwoods	4.47	MID2 MIB2 GIB2	Mixed upland Hardwood	65-74 65-74 75-84	fair fair good	Black oak 60% White oak 20% Mockernut Hickory 20%	12-18 10-16 6-12	48-72 50-80 36-72	Poor Heavy understory grazing	1.2 Ac. Steep slopes 15-25%
OF-1	Open Field	41.01	Co Ha GnB2 GID3 GID2 MIC3 MID3 ChB2	Mixed water Tolerant Hardwoods Mixed upland Hardwood	75-84 95+ 65-74 75-84 75-84 65-74 65-74 65-74	good good good good good fair fair fair	N/A	N/A	N/A	N/A	N/A
C-1	Crop Field	27.16	GnA GIB2 GIC2 MIC3 MIC2 MIB2	Mixed water Tolerant Hardwoods Mixed upland Hardwood	65-74 75-84 75-84 65-74 65-74 65-74	good good good fair fair fair	N/A	N/A	N/A	N/A	N/A
C-2	Crop Field	32.21	Co CuB GnA GIB2 GIC3 GID3 MIB2 MIC2	Mixed water Tolerant Hardwoods Mixed upland Hardwood	75-84 75-84 65-74 75-84 75-84 75-84 65-74 65-74	good good good good good good fair fair	N/A	N/A	N/A	N/A	N/A
L-1	Lawn (Farm Stead)	2.86	GIB2	Mixed upland Hardwood	65-74	fair	N/A	N/A	N/A	N/A	N/A
L-2	Lawn	1.62	MIB2	Mixed upland Hardwood	65-74	fair	N/A	N/A	N/A	N/A	N/A

Forest Stand Narrative

F-1 This forest stand is 4.47 Ac. in size and contains steep slopes. The canopy is dominated by black oak, Quercus velutina, white oak, Quercus alba and mockernut hickory, Carya tomentosa. The area is currently grazed and the understory is sparse.

L-1: This 2.86 Ac. area surrounds an existing house and various farm out buildings. The area contains lawn, and ornamental tree plantings. No environmentally sensitive areas are covered by L-1.

L-2: This 1.62 Ac. area surrounds an existing house located on the south west corner of the property. The are contains lawn and various ornamental plantings. The area contains no environmentally sensitive areas.

C-1: This 27.16 Ac. crop area is currently in active crop land production. There are no environmentally sensitive areas.

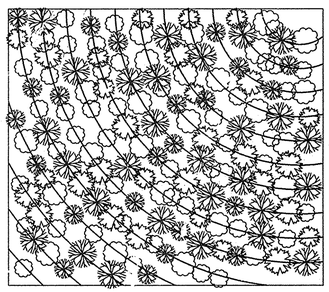
C-2: This 32.21 Ac, crop area is currently in active crop production. The area contains environmentally sensitive areas including streams and associated buffers.

OF-1: This 41.01 Ac. open field area contains grazing pastures and open field. The area contains wetlands, streams and associated buffers.

FOREST CONSERVATION EASEMENT TABLE

EASEMENT	TYPE	AREA (ACRES)
8	Reforestation	1.78
9	Reforestation	0.79
TOTAL		2.57

CURVILINEAR RANDOMIZED PLANTING



PLANT PLACEMENT DETAIL
NOT TO SCALE

1. MIX TREE AND SHRUB SPECIES IN THE STAGING AREA.
2. SET THE GUIDE CURVILINEAR LINE AS CLOSE TO CONTOUR AS POSSIBLE.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1/4/08

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/4/08

Easement 8: PLANTING AREA: 1.78 Ac.

1.78 Ac = 77,537 Sq. ft.

If 20 trees @ 2" cal = 20 trees x 435.6 s.f. (see size table chart) = 8712 SF
then 77,537 SF - 8,712 SF = 68,825 SF remain
68,825 SF = 1.58 Ac
1.58 Ac x 200 TPA (for 1" cal.) = 316 additional trees required @ 1" cal.

Qty	Botanical Name	Common Name	Size	Credit/Plant	Total Credit
70	Acer rybrum	Red Maple	1" cal.	217.8	15,246
2	Acer rubrum	Red Maple	2" cal.	435.6	871
47	Betula nigra	River Birch	1" cal.	217.8	10,237
3	Betula nigra	River Birch	2" cal.	435.6	1307
4	Cercis canadensis	Redbud	2" cal.	435.6	1742
47	Liquidambar styraciflua	Sweetgum	1" cal.	217.8	10,237
10	Liriodendron tulipifera	Tulip Poplar	1" cal.	217.8	2178
8	Nyssa sylvatica	Black Gum	1" cal.	217.8	1742
47	Platanus occidentalis	Sycamore	1" cal.	217.8	10,237
10	Platanus occidentalis	Sycamore	2" cal.	435.6	4356
9	Quercus alba	White Oak	1" cal.	217.8	1960
15	Quercus bi-color	Swamp White Oak	1" cal.	217.8	3267
57	Quercus palustris	Pin Oak	1" cal.	217.8	12,415
1	Quercus prinus	Chestnut Oak	2" cal.	435.6	436
6	Quercus rubra	Red Oak	1" cal.	217.8	1307

336 Total Plantings — 77,538 s.f. = 1.78 Ac.
(20 trees @ 2" Cal and 316 trees @ 1" Cal.)

Easement 9: PLANTING AREA: 0.79 Ac.

34,412 Sq. ft. (200 TPA) 1" cal. planting
0.79 acre x 200 TPA = 158 trees required

Qty	Botanical Name	Common Name	Size	Credit/Plant	Total Credit
32	Acer rubrum	Red Maple	1" cal.	217.8	6970
32	Betula nigra	River Birch	1" cal.	217.8	6970
32	Liquidambar styraciflua	Sweetgum	1" cal.	217.8	6970
32	Platanus occidentalis	Sycamore	1" cal.	217.8	6970
30	Quercus palustris	Pin Oak	1" cal.	217.8	6534

158 Total Plantings — 34,414 s.f. = 0.79 Ac.

Native Seed Mix

Percentage	Botanical Name	Common Name
25%	Agrostis alba	Redtop
25%	Carex vulpinoides	Fox Sedge
25%	Alopecurus pratensis	Meadow Fox Tail
20%	Andropogon scoparius	Little Bluestem
5%	Chrysanthemum leucan themum	Ox Eye Daisy

Surety in the amount of $55,974.50 shall be posted as part of the Developer's Agreement for 2.57 ac/111,949 sq ft.

Reforestation Area Monitoring Notes

1. Monthly visits during the first growing season are to assess the success of the plantings and to determine if supplemental watering, pest control, invasive plant management, mowing or other actions are necessary. Early spring visits will document winter kill and autumn visits will document summer kill.
2. The minimum survival rate shall be 75% of the total number of trees planted per acre at the end of the two year maintenance period. Wild tree seedlings from natural regeneration on the planting site may be counted up to 50% toward the total survival number if they are healthy native species at least 12 inches tall.
3. Survival will be determined by a stratified random sample of the plantings. The species composition of the sample population should be proportionate to the amount of each species in the entire planting to be sampled.
4. Effective monitoring will assess plant survivability during the first growing season and make recommendations for reinforcement planting if required at that time.

Forest Tree Protection and Management Notes

1. Any significant changes made to the Forest Conservation Plan shall be made with the prior approval if the Howard County Dept. Of Planning and Zoning.
2. Forest protection and management to be in accordance with a forest management plan. The plan shall be prepared by a MD. licensed forester to facilitate the landowners management objectives, such as wildlife enhancement, water quality, aesthetics, forest products, etc.
3. Future forest harvests may be conducted under a Howard County approved forest harvest plan, prepared by a MD. licensed forester.

Planting Areas Description

The proposed planting areas, totalling 2.57 Ac. is proposed entirely within stream and wetland buffer areas. The current land use is pasture land, making it an ideal area to plant and provide a forested stream buffer.

Planting will utilize a variety of sizes and species as shown in the proposed planting schedule. The larger stock will be placed farther upland. All container grown stock will utilize tree shelters. The entire area will be stabilized with the described seed mix cover crop. The planting as specified will more than satisfy the required acreage.

Plant Selection and Density Spacing Requirements.

Planting Material Size and Density Planting:
Planting size and density shall be varied with a combination of planting stock. Planting quantity and spacing are based on square footage credit, which varies by material size. A total of 43,560 sq. ft. of planting credit must be fulfilled for each acre planted. This credit can be fulfilled with any combination of material size in accordance with the following chart.

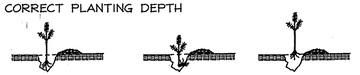
Plant Material Size Table.

Material Size	Spacing	TPA	Sq. Ft. Credit per Plant	Comments
2" caliper trees	20' x 20'	100	435.6	B & B
1" caliper trees	15' x 15'	200	217.8	B & B
seedlings or whips	11' x 11'	350	125	Container 1-3 gal w/tree shelters
seedlings or shrubs	8' x 8'	700	62	Bare root

SEEDLING AND WHIP PLANTING

NOTE: MULCHING NEWLY PLANTED SEEDLINGS HELPS THE SOIL RETAIN MOISTURE AND THE SEEDLING FROM COMPACTION AND STEM INJURIES.

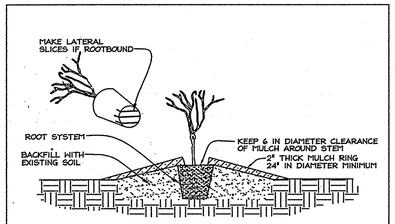
CORRECT PLANTING DEPTH



CORRECT
AT SAME DEPTH AS SEEDLING WAS GROWN IN NURSERY

INCORRECT
TOO DEEP AND ROOT IS BENT

INCORRECT
TOO SHALLOW AND ROOTS ARE EXPOSED

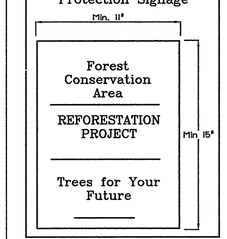


CONTAINER PLANTING
NOT TO SCALE

PLANTING PROCEDURE FOR CONTAINER GROWN PLANTS

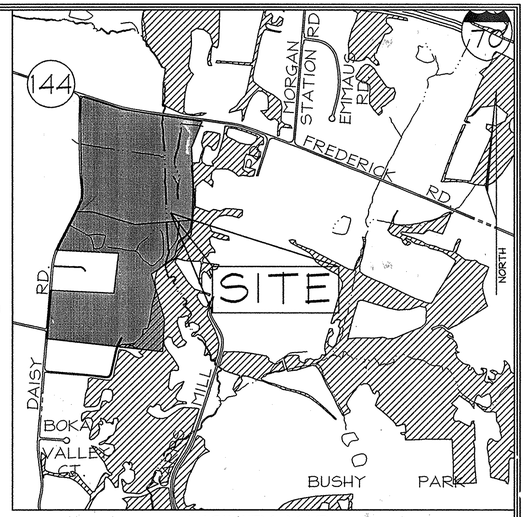
1. REMOVE THE PLANT EITHER BY CUTTING OR INVERTING THE CONTAINER
2. USE A KNIFE TO CUT THROUGH BOTTOM HALF OF THE ROOT BALL.
3. PLANT SHRUBS ON FORMED UP MOUNDS 4" ABOVE THE EXISTING GRADE WHEN HIGH WATER TABLE CONDITIONS EXIST, OTHERWISE PLANT FLUSH WITH EXISTING GRADE.
4. PLANTING HOLE TO BE 2-3 TIMES THE DIAMETER OF THE CONTIANER.
5. INSERT FERTILIZER TABLET, BACKFILL 2/3 OF THE ROOT BALL AND WATER.
6. AFTER WATER PERCOLATES, BACKFILL HOLE TO TOP OF ROOT BALL AND GENTLY TAMP SOIL TO FIRM CONTACT WITH PLANT.
7. APPLY MULCH RING AROUND PLANT KEEPING A 6 IN CLEARANCE FROM STEM.

Reforestation and Afforestation Area Protection Signage



SIGN DETAIL: PERMANENT SIGN

SIGNAGE NOTE: ALL TREE PROTECTION SIGNS SHALL BE PLACED ON METAL 'T' POSTS OR PRESSURE TREATED WOOD POLES. NO ATTACHMENT OF SIGNS TO TREES IS PERMITTED.



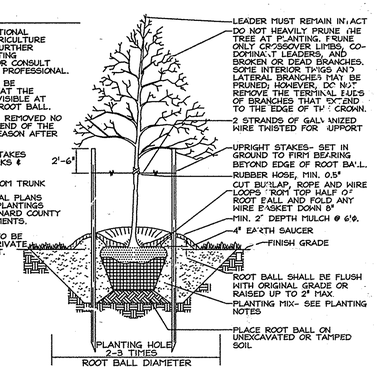
VICINITY MAP
SCALE: 1"=1000'

Reforestation Area Planting Notes

1. Initial planting inspection and certification required. Planting contractor to notify Howard County after planting is complete.
2. Reforestation areas may be planted as soon as reasonable to do so. Late winter- early spring plantings are preferred. Earliest planting dates will vary from year to year but planting may generally begin as soon as the ground is no longer frozen. Alternate planting dates may be considered as conditions warrants.
3. Soil amendments and fertilization recommendations will be made based upon the results of soil analysis for nitrogen, phosphorus, potassium, organic matter content and pH. If required, fertilizer will be provided using a slow release, soluble 16-8-16 analysis designed to last 5-8 years contained in polyethylene perforated bags such as manufactured by ADCO Works, P.O. Box 310 Hollins, N.Y. 11423 or approved equal.
4. Plant materials shall be planted in accordance with the planting diagram, planting details and planting schedule.
5. Plant stock must be protected from desiccation at all times prior to planting. Materials held for planting shall be moistened and placed in cool shaded areas until ready for placement.
6. Planting materials shall be nursery grown and inspected prior to planting. Plants not conforming to the American Standards for Nursery Stock specifications for size, form, vigor, or roots, or due to trunk wounds, breakage, desiccation, insect or disease must be replaced.
7. Newly planted trees may require watering at least once per week during the first growing season depending on rainfall in order to get established. The initial planting operation should allow for watering during installation to completely soak backfill materials.
8. Mulch shall be applied in accordance with the diagram provided and shall consist of composted, shredded hardwood bark mulch, free of wood alcohol.
9. Planting holes should be excavated to a minimum diameter of 2.5 to 3 times the diameter of the root ball or container. Mechanical auguring is preferred with scarification of the sides of each hole.
10. All nursery stock may be sprayed with deer repellent containing Bitrex such as Repellex(TM). All nursery stock to be grown with deer repellent tablets in growing medium, such as Repellex Tablets.

NOTES

1. CONSULT INTERNATIONAL SOCIETY OF ARBORICULTURE GUIDELINES FOR FURTHER DETAILS OF PLANTING SPECIFICATIONS, OR CONSULT WITH A QUALIFIED PROFESSIONAL.
2. EACH TREE SHALL BE PLANTED SUCH THAT THE TRUNK FLARE IS VISIBLE AT THE TOP OF THE ROOT BALL.
3. STAKES SHALL BE REMOVED NO LATER THAN THE END OF THE FIRST GROWING SEASON AFTER PLANTING.
4. PLACE UPRIGHT STAKES PARALLEL TO WALKS & BUILDINGS.
5. KEEP MULCH 1" FROM TRUNK
6. SEE ARCHITECTURAL PLANS FOR ADDITIONAL PLANTINGS WHICH EXCEED HOWARD COUNTY MINIMUM REQUIREMENTS.
7. TREES ARE NOT TO BE PLANTED OVER PRIVATE SEWAGE EASEMENT.



TYPICAL TREE PLANTING AND STAKING
DECIDUOUS TREES UP TO 2-1/2" CALIPER — NOT TO SCALE

No As-Built information is required on this sheet

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER

12-19-14

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-31-14

STATE OF MARYLAND — STEPHEN H. HASSEN — PROFESSIONAL FORESTER

OFFSITE FOREST MITIGATION PLAN for KINDLER OVERLOOK

(LOTS 1-19 and Open Space Lot 20)
on Talley Property Parcel 1 & 2
RE-03-02 DS2, P.N. 15816, F-04-054 F.C.
F.N. 17192, TM 8, TM PARCEL 312
TAX MAP 8 GRID 15 PARCEL 309
4TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562

OWNER
Talley Family LLP
1525 Daisy Road
Woodbine, MD 21797
410-442-2300

EXPLORATION RESEARCH, INC.
ENVIRONMENTAL CONSULTANTS
LANDSCAPE ARCHITECTS
6339 HOWARD LANE
ELKRIDGE, MARYLAND 21075
TEL: (410) 527-5510 FAX (410) 796-1562

DESIGN BY: RAB
DRAWN BY: SMM
CHECKED BY: SLH
SCALE: As Shown
DATE: Dec. 18, 2007
W.O. No.: 2421
SHEET No.: 13 OF 13

AS-BUILT

F-07-03

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